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Speed Management for Enhancing Road Safety in West Bengal: Policy Interventions and Roadmap



Transport Department, Govt. of West Bengal
in collaboration with
Indian Institute of Technology Kharagpur

Speed Management for Enhancing Road Safety in West Bengal: Policy Interventions and Roadmap

Prepared by
Transport Department, Govt. of West Bengal

in collaboration with
Indian Institute of Technology Kharagpur

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7th November 2023

FOREWORD

The Government of West Bengal attaches utmost priority to all the necessary aspects relating to the subject of road safety. Over the past few years, the state has witnessed several initiatives under “Safe Drive Save Life (SDSL)” campaign which have been instrumental in improving the overall road safety scenario in the state. However, with the number of road crashes and resulting fatalities still remaining substantial, further interventions are warranted to reduce the same.

The share of over-speeding related road crashes is still very high, thereby making speeding one of the prime causes of resultant fatalities in the country. The problem is compounded by the fact that a good number of these fatalities are those of the vulnerable road users (VRUs) including pedestrians, cyclists, moped and motorcycle riders. These VRUs often share the same road space with high-speed vehicles. The presence of a speeding vehicle increases the potential danger to such VRUs significantly, given the heterogeneous traffic scenario prevalent in India. It is, therefore, imperative to take effective measures towards speed management on our roads.

It is heartening to note that the Transport Department, Govt. of West Bengal has taken an initiative to bring out the ‘Speed Management Roadmap for Enhancing Road Safety in West Bengal’ in close association with the Indian Institute of Technology, Kharagpur. The relevant document has been prepared after suitable reviews, inputs and feedback from all the stakeholders including the allied departments, agencies and road safety experts.

This document discusses various issues related to speeding in a methodical manner and recommends suitable interventions related to speed management. The interventions, inter alia, include Safe Speed Limit, Engineering Measures, Enforcement, Capacity Building and Piloting. A roadmap has accordingly been formulated encompassing the responsibilities of each of the allied agencies with a view to reduce the number of road accident fatalities.

I am sure that this initiative will further strengthen our efforts to make our roads safer for the pedestrians and motorists. Suggestions and feedback for further improving this document are more than welcome from one and all.

(Dr. Hari Krishna Dwivedi)

Chief Secretary to the Govt. of West Bengal
& Chairman, State Road Safety Council

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Dated, the 29/11/2023....

MESSAGE

Road traffic crashes are one of the leading causes of fatality globally. Having one of the largest road networks in the world, the issue of road safety assumes importance in India. In 2021, more than four hundred thousands road crashes took place in India, resulting in around 1.54 lakh fatalities. Being one of the most densely-populated states in India, West Bengal has its own share of road crashes and fatalities. Speeding has been identified as the major cause in this regard.

The state of West Bengal has taken several significant initiatives under “Safe Drive Save Life (SDSL)” campaign to improve road safety through systematic interventions including generation of all-round awareness among the road users. The adoption of ‘Safe System Approach’ has been adopted as the first step towards addressing the issue of over-speeding. The Safe System approach, while acknowledging human error resulting in road crashes, ensures that the same do not result in a fatality or a major injury. As one of the five pillars of a safe system approach, safe speed of vehicles becomes one of the prime means in reducing road crashes and resulting fatalities

The Government of West Bengal, therefore, has come out with a ‘Speed Management Roadmap for Enhancing Road Safety in West Bengal’ which has been drafted in association with IIT Kharagpur. The document has been extensively reviewed by different stakeholders and road-safety experts before being finalized. The speed management policy interventions presented here are commensurate with the recommendations of the Supreme Court Committee on Road Safety (SCCoRS). I strongly believe that this document will help us tackle the menace of speeding, thereby significantly enhancing the road safety scenario in the state.

Snehasis Chakraborty
(Snehasish Chakraborty)

Dr. Saumitra Mohan, IAS
Secretary



Government of West Bengal
Transport Department

No.533/Secy(Tr.)/2023

Dated: 29/11/2023

MESSAGE

Road crashes and resulting fatalities are emerging as a significant societal issue. Speeding has been identified as the leading cause of road crashes in India as well as in the state of West Bengal. It is in this context that a focus on speed management becomes necessary to reduce the number of road crashes and associated fatalities in the state.

The Transport Department, in collaboration with the Indian Institute of Technology Kharagpur has come up with the 'Speed Management Roadmap for Enhancing Road Safety in West Bengal' with a view to improve the road safety scenario in the state through a scientific and holistic approach. This document visualizes several meaningful interventions related to speed management. This includes Organizational Framework, Safe Speed Limit, Engineering Measures, Crash Data Collection, Electronic Enforcement, Capacity Building, Education and Awareness.

The document emphasizes on safe speed limits in addition to the traditional road and traffic engineering criteria. The safe speed limits have been prescribed separately for rural as well as urban roads while factoring different roadways, traffic scenarios and control conditions. This is the first document where the safe speed limits have been suggested on the basis of these three criteria. A roadmap, including the responsibilities and time-schedules of each of the allied departments, has also been provided for streamlining the road safety architecture in the state.

The document has been reviewed extensively by both national and international road safety experts as well as the concerned Departments and stakeholders. The State Lead Agency on Road Safety had been continuously monitoring the progress during the preparation of this document and provided valuable inputs. We are grateful to all the stakeholders including the Lead Agency for their continuous support.

Dr. Saumitra Mohan, IAS



Vineet Kumar Goyal IPS
Commissioner of Police
Kolkata

Message

Nowadays road safety is one of the biggest public health issues throughout the world. It is imperative for a happy, healthy, and prosperous life of an individual as well as that of the nation as a whole. Road crashes and resulting road fatalities are also a major concern in the State of West Bengal. In urban areas like the city of Kolkata, road capacity augmentation is often difficult due to the physical constraints which adds to the complexities. Under such circumstances, Kolkata Traffic Police has been discharging their responsibilities of maintaining safe and efficient traffic operations in the city of Kolkata. However, it is not always possible for the Police alone to ensure road safety. The road users as well as other concerned stakeholders also have a crucial role to play in this regard. Keeping this in mind, the Government of West Bengal under the stewardship of the Honorable Chief Minister has taken several significant initiatives under the “Safe Drive Save Life” campaign to enhance the statewide road safety. This campaign was launched on 8th July 2016 and since then, has already brought positive changes which are evident from the reduced numbers of road crashes and fatalities in the city of Kolkata in recent years.

Out of all such cities in India where the population is over 5 million, Kolkata is ranked 16th and 33rd with respect to total number of crashes and resulting fatalities in 2021. It is quite encouraging that in the last 7 years, there has been a reduction of more than 60% in the number of road crashes and resulting fatalities in the city of Kolkata since the beginning of the Safe Drive Save Life campaign. It has been observed that speeding is the single gravest contributor to Road Traffic Accidents which is taking lives of mostly the pedestrians and motorized two-wheelers as evident from the statistics. In general, more than 80% of the crash fatalities in Kolkata include the vulnerable road users. Therefore, further interventions are needed through effective speed management to make immediate impacts in terms of bringing down road crashes and fatalities in the city.

Kolkata Police has been closely working with IIT Kharagpur to enhance road safety. The two had joined hands to host a National Conference on Traffic Management and Road Safety in December 2016 followed by one exhibition on road safety. This was attended by law enforcement agencies from across the nation.

The Transport Department, Government of West Bengal, in collaboration with Indian Institute of Technology Kharagpur, has come up with the ‘*Speed Management for Enhancing Road Safety in West Bengal: Policy Interventions and Roadmap*’ document with a view to enhance the road safety scenario in the state through a scientific and holistic approach. The document helps in identifying priority areas and recommending interventions related to all the necessary speed management aspects such as Organizational Framework, Safe Speed Limit, Engineering Measures, Crash Data Collection, Electronic Enforcement, Capacity Building, Education & Awareness, Pilot Implementations, etc. A roadmap, including the responsibilities of each of the allied departments with respective time schedules, has also been provided for streamlining the corresponding activities.

I am really happy that the document has all the necessary information to address the pertinent gaps and I am sure that it will make a significant contribution to the welfare of the society. I congratulate the Transport Department and the expertise of IIT Kharagpur for dedicating their efforts to prepare this document. I sincerely hope that this document will receive all the appreciation it deserves and usher a very positive change among all the stakeholders as well as the concerned departments.

Commissioner of Police
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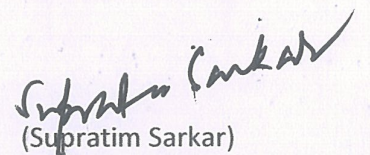
Message

Road safety continues to be a major developmental issue, and a leading cause of death and injury across the nation as well as our state. The cost of road accidents is borne not only by the victims and their families, but by the economy as a whole in terms of untimely deaths, injuries, disabilities and loss of potential income. It is indeed a matter of great concern that despite the continuing efforts of the West Bengal Police to minimize the losses, road crashes and resulting fatalities are still being reported at various locations throughout the state. Speeding has consistently been found to be the biggest form of traffic violation resulting in crashes, fatalities, and grievous injuries.

The “Safe Drive Save Life” campaign launched by the Honourable Chief Minister of West Bengal intends to improve the overall road safety scenario in the state, and it has already become successful in gaining recognition of the common people and enhancing road safety awareness among them. In order to further strengthen the initiatives, the Transport Department, in collaboration with Indian Institute of Technology Kharagpur, has come up with the ‘Speed Management for Enhancing Road Safety in West Bengal: Policy Interventions and Roadmap’ document which provides a comprehensive source of knowledge for combating the menace of speeding in West Bengal.

As one of the most densely populated states in India, West Bengal has a vast road network with significant roadside developments and activities. In several occasions, the development of roads and allied facilities is restricted by physical constraints. Under such circumstances, it becomes more important to focus on the speeding issue and adopt state-wide effective speed management programme to make immediate impacts in terms of bringing down road crashes and fatalities with a significant margin, as well as protect the pedestrians, two-wheelers, and other road users in a more comprehensive manner. I am very happy to notice that this ‘Speed Management for Enhancing Road Safety in West Bengal: Policy Interventions and Roadmap’ document has all the necessary ingredients for contributing towards the benefits of the society. The document has been reviewed extensively by all the officers of the allied departments and road safety experts.

The document emphasizes on impact of speeding and suggests interventions under several important aspects such as Safe Speed Limit, Engineering Measures, Crash Data Collection, Enforcement, Capacity Building, Piloting, etc. It also includes a roadmap containing the responsibilities of each of the allied departments in order to achieve the goal of reduction in traffic fatalities with a focus on coordinated work flow among the departments. I congratulate the team of Transport Department and IIT Kharagpur for their efforts in preparing this document with the potential for high societal impact. It is my sincere expectation that this document will also receive acceptance and recognition among road users.


(Supratim Sarkar)



Dated: 08.11.2023

Message

Road safety is a priority area for the Government of West Bengal, and the State has taken several significant initiatives to reduce road crashes and resulting fatalities. Public Works Department (PWD) being a key nodal department in the state for road development, has been working continuously to make the roads safer for all road users using various road engineering interventions. However, West Bengal being one of the densely populated states has its own unique restraints, and the development of road infrastructure is often restricted by physical constraints. Although there has been an overall improvement in the quality of roads in the State, there are further opportunities for engineering interventions to make the roads safer for all road users, especially the vulnerable road users like pedestrians and bicyclists.

In the State, speeding is recognized as a major reason for road crashes and resulting fatalities. Also, the share of vulnerable road users in road fatalities is very significant. Therefore, it is appropriate at this juncture to define safe speed limits giving due considerations to not only the road but also traffic and human injury tolerance. Also, it is necessary to improve associated road engineering aspects to inform road users about the posted speed limits and also to encourage them to follow the posted safe speed limit. With this background, the Govt. of West Bengal has taken up an important initiative to bring out the 'Speed Management for Enhancing Road Safety in West Bengal: Policy Interventions and Roadmap' document in close cooperation with Indian Institute of Technology Kharagpur, and this has been reviewed extensively by all the officers of the allied departments and road safety experts. The engineers of the PWD have also reviewed the documents and given their valuable inputs in the process of finalizing the document.

I would like to congratulate the engineers of PWD and also all the officers of various other stakeholder departments who have contributed significantly to bring out this important document for the benefit of road users in the state of West Bengal. My special thanks to Prof. Bhargab Maitra from IIT Kharagpur for his immense contribution and also for leading the initiative in bringing out this valuable document. It is my sincere expectation that the recommendations and the roadmap, as outlined in the document, will be followed by all the stakeholder departments including the PWD and that the interventions will also receive acceptance and recognition among road users.

Secretary,
Public Works Department
Government of West Bengal

PREFACE

Road traffic injuries are a major public health problem and one of the primary causes of unnatural deaths in India. Besides creating enormous social costs for individuals, families, and communities, road traffic injuries place a heavy burden on health services and the national economy. Being one of the most densely populated states in India, West Bengal is also associated with a significant share of road crashes and resulting fatalities. The road crash severity rate in the state is significantly higher than the national average value. Recognizing this issue, several initiatives have been taken in different facets to improve road safety by focusing on all the 4 E-s of road safety (i.e., Engineering, Enforcement, Education, and Emergency Response). Attempts have been made to create safer roads through systematic engineering interventions and giving due consideration to the requirements of all road users. Though, these initiatives have positively impacted the road safety scenario in the state, further interventions are still needed to make immediate impacts with a view of bringing down the numbers of road crashes and fatalities for the benefit of the larger society.

Speeding has consistently been found to be the biggest form of traffic violation resulting in crashes, fatalities, and grievous injuries. The situation becomes more complicated because of the prevailing non-lane based mixed traffic environment which comprises a mix of various motorized and non-motorized vehicles with diverse static and dynamic characteristics. In 2022, the share of road crash fatalities due to speeding in the state is found to be 32.27%. Around 70% of the crash fatalities include vulnerable road users (VRUs) such as pedestrians, cyclists, moped and motorcycle riders, who form a major proportion of traffic and share the same road space with high-speed vehicles. Speeding can become lethal for such VRUs as they are significantly less protected. In light of the present scenario, effective speed management becomes a matter of utmost necessity as a means of reducing road crashes and fatalities in the short run, thereby significantly uplifting the road safety scenario in West Bengal with immediate effect. This important concern was also realized by the State Government, and an urgent need was felt to come up with this 'Speed Management for Enhancing Road Safety in West Bengal: Policy Interventions and Roadmap' document with a view to enhance the road safety scenario in the state through a scientific and holistic approach.

A team of researchers from Indian Institute of Technology Kharagpur contributed to coming up with several specific aspects in this document which comprehensively covers all relevant areas related to effective speed management with a focus on road safety. Different stringent safety rules and regulations are observed in many countries around the world and several codes of practice, legal rules, etc. have also been laid out in India. The authors have considered available literature, reviewed good and safe practices to prepare this document with an attempt to explain the complex aspects of speed management in a very simple manner through texts and graphical representations. The impact of speeding on the safety and serviceability of a traffic system is discussed thoroughly with the help of scientific evidences. The adoption of 'Safe System Approach' which provides a viable framework to examine road traffic injury risk factors and interventions from a holistic perspective, is considered as the first step towards tackling the problem of speeding. The Safe System principle recognizes that people will make mistakes that may lead to road crashes, but the system should be forgiving enough to ensure that those crashes do not result in a fatality or even a major injury; the care for human life and well-being are considered to be more important than anything else. The speed management policy presented in the document is commensurate with the initiatives recommended by the Supreme Court Committee on Road Safety (SCCoRS), and concomitantly with the safe system approach. The document also recommends interven-

tions under several important aspects such as Safe Speed Limit, Engineering Measures, Crash Data Collection, Enforcement, Capacity Building, Piloting, etc. It emphasizes on setting safe speed limit on the basis of human injury tolerance criteria in addition to the traditional road engineering and traffic engineering criteria. The safe speed limits have been prescribed separately for rural as well as urban roads with respect to different roadway, traffic and control conditions. Furthermore, a roadmap, including the responsibilities of each of the allied departments with respective time schedules, has also been provided for streamlining the corresponding activities. The document has been studied and reviewed by the officers from all the concerned stakeholders as well as several external road safety experts (both national and international).

I am really grateful to the Transport Department, Government of West Bengal for bringing out this document in the background of the on-going “Safe Drive Save Life” campaign. I acknowledge their support and cooperation for preparing this document. I am indebted to The Global Road Safety Partnership (GRSP), a hosted project of the International Federation of Red Cross and Red Crescent Societies (IFRC), for helping us with the necessary grant required for this work. I am grateful to my Institute IIT Kharagpur for all encouragement and support to bring out this document as a humble contribution to the welfare of the society. I acknowledge my deep sense of gratitude to Dr. Sudeshna Mitra for supporting me and sharing valuable thoughts & suggestions on preparing this document. I express my earnest appreciation to my colleagues – Prof. Arkopal Kishore Goswami, Prof. Uday Shankar, and Prof. Swati Maitra, for their unwavering support. I would also like to express my heartfelt thanks to the research scholars – Dr. Kaniska Ghosh, Dr. Kinjal Bhattacharyya, Dr. Roshan Jose, Annam Sai Kiran, Sudipa Chatterjee, and Abhishek Chakraborty, who have contributed significantly in preparing as well as shaping this document to its current form. It is my sincerest hope that the document will be useful not only for the concerned decision-making agencies, but also for the general road users. With this intention in mind, I encourage you go through this document, share the knowledge with your peers, and work together to achieve significant societal benefits in terms of enhancing the road safety in the State of West Bengal.

September 18, 2023

Bhargab Maitra
Editor

BACKGROUND

Road traffic injuries are a major public health problem and a leading cause of death and injury. Globally, nearly 1.3 million people die, and millions more are injured or disabled every year, as a result of road crashes¹. Low-income and middle-income countries account for about 85% of the deaths and 90% of the annual Disability Adjusted Life Years (DALYs) lost due to road traffic injury². Among 199 countries worldwide, India is considered to be the most unsafe for road users, accounting for almost 11.6% of the crash related deaths³. In 2022, more than 4 lacs road crashes took place in India, resulting in around 1.68 lacs death⁴ which is equivalent to an aircraft crash with 462 fatalities every day. Besides creating enormous social costs for individuals, families, and communities, road traffic injuries place a heavy burden on health services and the national economy. India loses 3% of its GDP due to road crashes⁵. The socio-economic burden of road crashes is observed to be disproportionately borne by poor households in India – the decline in total household income is found to be sharper among low-income households (75%) than high-income households (54%) during 2005-2019⁶.

Road crashes and resulting road fatalities are also a major concern in the State of West Bengal. In 2022, West Bengal recorded a total of 13,686 road crashes resulting in 6,002 fatalities⁷, ranking 11th in both case among the Indian states. The number of road crashes in the last 7 years and classified share of crash fatalities in 2022 with respect to the type of impacting objects/ vehicles are presented in Figure 1.

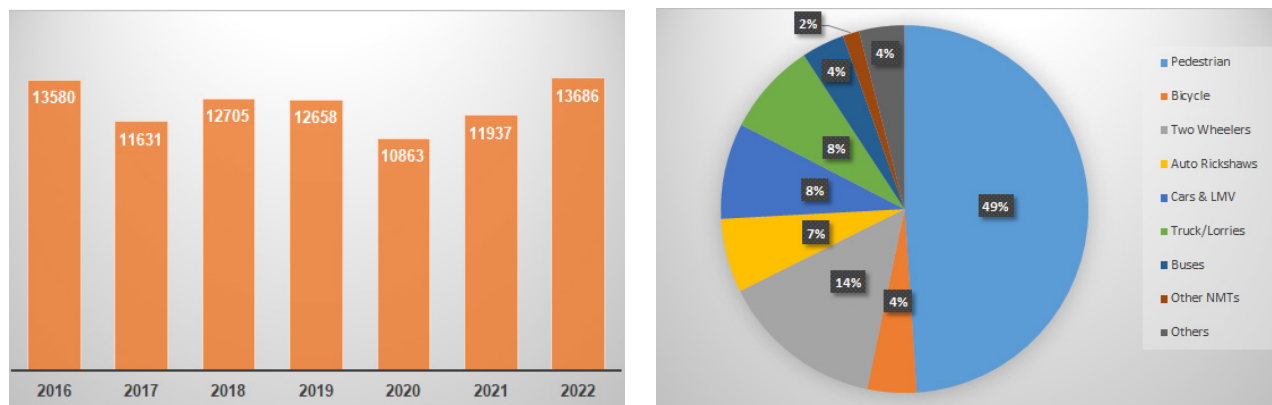


Figure 1(a). Total Number of Road Crashes in West Bengal;
Figure 1(b). Crash Fatalities Classified According to Types of Impacting Object/ Vehicle in 2022

¹ World Health Organization. Global status report on road safety 2018. Geneva: World Health Organization; 2018.

² Peden, Margie, Richard Scurfield, David Sleet, Adnan A. Hyder, C. Mathers, Eva Jarawan, A. A. Hyder, D. Mohan, and E. Jarawan. World report on road traffic injury prevention. World Health Organization, 2004.

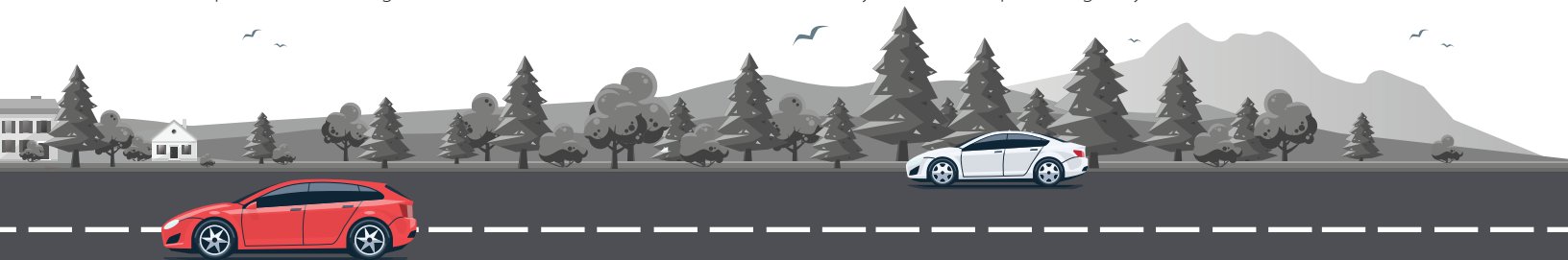
³ International Road Federation. World Road Statistics 2018. <https://www.worldroadstatistics.org/>

⁴ Transport Research Wing. Road Accidents in India – 2022. New Delhi: Ministry of Road Transport & Highways, Government of India; 2023.

⁵ UNESCAP. (2017) Road Safety in India – Status and Challenges. <https://www.unescap.org/our-work/transport>

⁶ The World Bank. Traffic Crash Injuries and Disabilities: The Burden on Indian Society; 2021.

⁷ Transport Research Wing. Road Accidents in India – 2022. New Delhi: Ministry of Road Transport & Highways, Government of India; 2023.

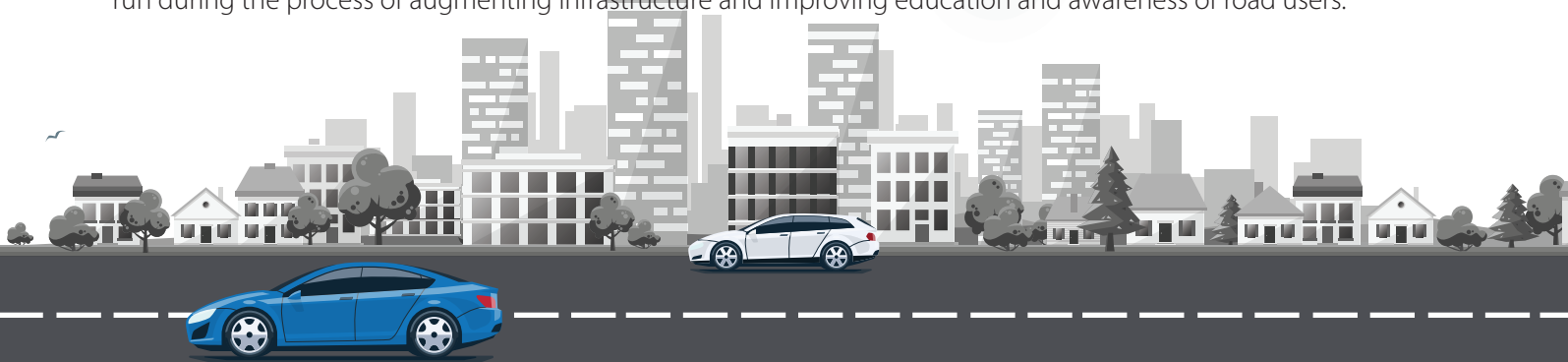


The crash severity rate (number of fatalities per hundred crashes) in the State is higher than the national average. For example, in 2022, West Bengal had a crash severity rate of around 43.9, whereas the national average was 36.5. Therefore, it is evident that the road crashes and resulting fatalities are still significant in the State, and further interventions are necessary to reduce these numbers for the benefit of the larger society.

Being one of the most densely populated states in India, West Bengal is also associated with very significant roadside developments and activities. The roads have no access control and, in several occasions, the development of roads and allied facilities is restricted by physical constraints (e.g., non-availability of land). There are opportunities to further improve infrastructure for the vulnerable road users or VRUs (e.g., pedestrian crossings, bicycle facilities, etc.) to segregate VRUs from high-speed vehicular traffic. This is clearly reflected in Figure 1(b) with the involvement of VRUs accounting for around 70% of the crash fatalities. The education and awareness level of road users towards road safety also needs further improvement. Altogether, road safety scenario is extremely complex and challenging in the State of West Bengal.

Road Safety Initiatives in West Bengal

Over the last few years, the state has taken several significant initiatives under “Safe Drive Save Life (SDSL)” campaign to improve road safety by focusing on all the 4 E-s of road safety (i.e., Engineering, Enforcement, Education, and Emergency Response). Attempts have been made to create safer roads through systematic engineering interventions and giving due consideration to the requirements of all road users. Concerted road safety campaigns have been organized throughout the State involving all segments of society to aware and educate road users about common dos and don'ts of using the road infrastructure. Enforcement has been strengthened by the traffic police. Several thousand CCTV cameras have been set up across the State to detect and penalize unsafe acts. Multiple capacity building workshops have been organized to train the traffic personnel who are directly involved in enforcement of traffic rules and regulations. The Government has taken dynamic steps to educate and make the road users aware of the dangers of unsafe driving. A holistic approach has been taken to audit the motor training schools, identify the gaps and strengthen the driver licensing system. A training manual for drivers has also been published as a novel effort in the national perspective. The manual has been prepared by relevant experts and covers all the aspects of road safety that a driver needs to be aware of. In order to achieve maximum benefits from the manual, wide-scale capacity building has been executed through training the trainers of all motor training schools in the state. Special workshops have been directed towards educating the school children who would contribute as aware and safe future road users in the society. For augmenting emergency response, (i) ambulance services, in the name of “KARMA”, have been augmented and improved specifically to cater to crash victims, (ii) several hospitals and trauma care centres have been planned, and (iii) in several instances, “Green Corridor” has been implemented successfully to cater to the needs of road crash victims. The Government is also utilizing social media platforms such as Twitter and Facebook to extend its message to the new generation road users using innovative slogans, images and posters which proved to be quite popular. All these initiatives have positively impacted the road safety scenario and awareness level among road users in the state. At this juncture, it is important to take further interventions to make immediate impacts in terms of bringing down road crashes and fatalities in the state. The safety deficiencies related to infrastructure as well as road users’ education and awareness cannot be overcome in a short time. Therefore, it is necessary to think about other measures which can be effective in reducing road crashes and fatalities in the short run during the process of augmenting infrastructure and improving education and awareness of road users.



SAFE SYSTEM APPROACH

To deal with the growing road traffic crash and injury problems, the World Health Organization (WHO) and the World Bank recommended a “system-wide, multi-sectoral implementation of proven road safety interventions that are culturally appropriate and locally tested” approach that countries may consider advantageously to improve their road safety records⁸. In this regard, The Safe System Approach (Figure 2), which provides a viable framework to examine road traffic injury risk factors and interventions from a holistic perspective⁹, has been recognized as the most effective way of considering and responding to fatal and serious casualty crash risks on a network.



Figure 2. The Safe System Approach¹⁰

The Safe System approach to road safety management is based on the safe system principle which states that our life and health should not be compromised by our need to travel; no level of death or serious injury is acceptable in the road transport network. The Safe System principle recognizes that people will make mistakes that may lead to road crashes, but the system should be forgiving enough to ensure that those crashes do not result in a fatality or even a major injury. A safe system anticipates human mistakes and keeps impact energy on the human body at

⁸ Peden, M. World report on road traffic injury prevention; 2004.

⁹ World Health Organization. Save lives: a road safety technical package; 2017.

¹⁰ Federal Highway Administration. Safe System Brochure; 2017.



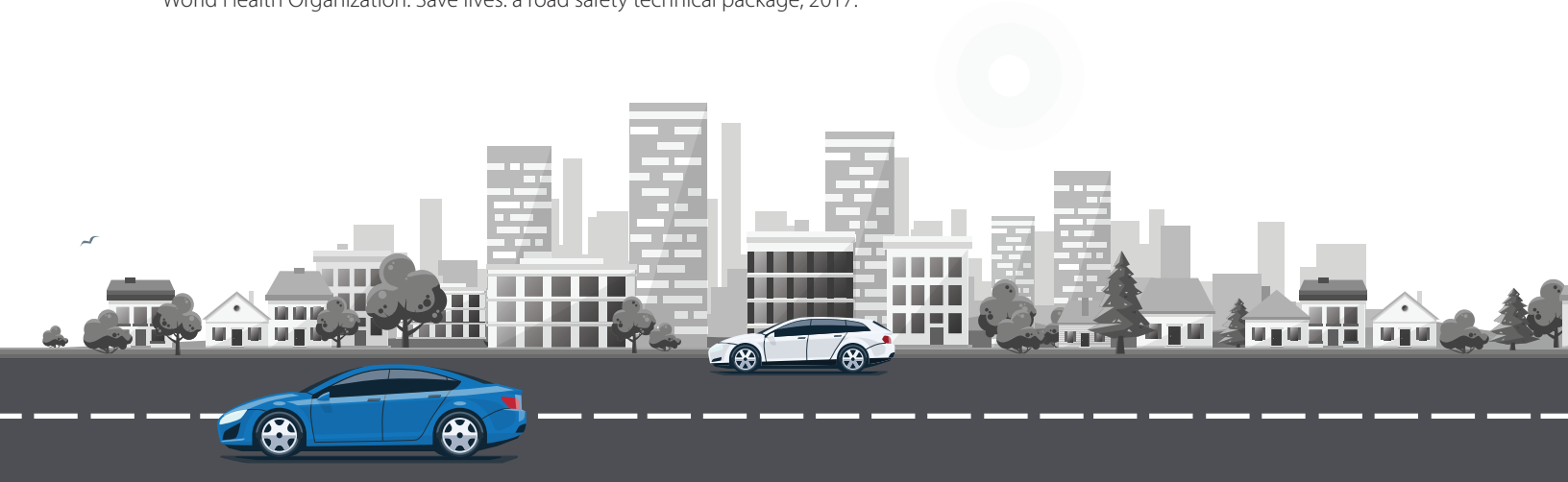
tolerable levels, keeping in mind that the human body can only withstand a certain level of kinetic energy before a crash will result in death or serious injury. The care for human life and wellbeing are considered to be more important than anything else.

The safe system approach represents an ambitious safety performance level and current best practice safety culture in road safety¹¹. It employs demonstrably effective practices using innovative solutions and new technologies. A safe system has five pillars of action (as shown in Figure 2), namely (i) Safe Roads, (ii) Safe Road Users, (iii) Safe Speeds, (iv) Safe Vehicles, and (v) Post-Crash Care¹². As per this approach, safety is treated in a proactive manner; i.e., tools should be used to identify and mitigate latent risks in the transportation system, rather than waiting for crashes to occur and reacting afterwards. All stakeholders (ministries and allied departments of Central and State Governments, enforcement agencies, transportation system users and managers, vehicle manufacturers, etc.) must ensure that crashes don't lead to fatal or serious injuries. Risks associated with all parts of the system need to be strengthened, so that in case of failure of one part, the other parts still have the capability of protecting road users. To ensure these, safe system frameworks such as 'Vision Zero' (Sweden), 'Sustainable Safety' (Netherlands) and 'Safe Systems' (Australia) aim for long-term management of speed on the roads¹³. Therefore, the safe system approach is proposed for implementation in this context in order to reduce road crashes and resulting fatalities in the State of West Bengal.

¹¹ Parliamentary Advisory Council for Transport Safety. Safe System; 2021.

¹² Federal Highway Administration. Safe System Brochure; 2017.

¹³ World Health Organization. Save lives: a road safety technical package; 2017.



ROLE OF SPEED

Speed is an important factor in defining serviceability and safety of a traffic system. It is at the core of any road traffic injury, which influences both the risk as well as the severity of a road crash. Experts recognize inappropriate speed limits (i.e., posted speed limits which are unsafe for the prevailing conditions) and speeding (i.e., driving above the posted speed limits) as major contributory factors in both the number and severity of traffic crashes. Controlling vehicle speed can prevent the occurrence and reduce the impact of a crash, lessening the severity of injuries sustained by the victims. According to the WHO, 40-50% of drivers across the world exceed the safe speed limit.¹⁴

In India, during the year 2022, about 71% of road crash fatalities¹⁵ were caused by speeding. The State of West Bengal reported a total of 4,080 road crashes due to speeding, resulting into 1,937 fatalities and 3,431 grievously injured persons in 2022¹⁶. The share of road crash fatalities due to speeding in the State is 32.27%, indicating an opportunity to improve further in this regard.

Speed is a critical factor for road safety in both state and national levels due to the prevailing heterogeneous traffic environment. The Indian traffic system comprises of a mix of various motorized and non-motorized vehicles with diverse static and dynamic characteristics. It is important to note that a high proportion of traffic is composed of vulnerable road users (VRUs) such as pedestrians, cyclists, and moped and motorcycle riders - who share the same road space with high-speed vehicles. Speed can be lethal for such VRUs as they are significantly less protected. With the increase in speed, a driver's field of vision narrows, and there are higher chances that the driver misses a potential hazard, leading to a severe crash. A study by the Federal Motor Carrier Safety Administration, DATH¹⁷ has presented the decrease in human field of vision with the increase in speed as illustrated in Figure 3.

Furthermore, in a heterogeneous traffic scenario, exceeding the speed limit by a seemingly inconsequential 10 kmph can not only significantly increase the risk of a crash but also endanger the lives of other road users. For example, if a child runs onto the road (perhaps to retrieve a ball) 45 m ahead of a car that is travelling at 55 kmph, the car can brake to a complete stop (under normal circumstances) without hitting the child. However, if the vehicle speed increases by 10 kmph, the situation changes dramatically. At 65 kmph, the car will still be travelling at approximately 32 kmph when it hits the child, which can cause major injuries or even death. This variation in stopping distance is due to the distance travelled during (i) reaction time (i.e., time taken from the instant an object is visible to the instant brakes are applied effectively) and (ii) time taken by a vehicle to come to a stop after application of brakes. The stopping distances under different speeds are illustrated in Figure 4. The stopping distance includes both lag distance or distance travelled during reaction time (shown as green) and braking distance (shown as yellow).

¹⁴ World Health Organization. Speed Management Infographics.

Link: www.who.int/roadsafety/week/2017/Speed_Management_infographic_en.pdf?ua=1

¹⁵ Transport Research Wing. Road Accidents in India – 2022. New Delhi: Ministry of Road Transport & Highways, Government of India; 2023.

¹⁶ Transport Research Wing. Road Accidents in India – 2022. New Delhi: Ministry of Road Transport & Highways, Government of India; 2023.

¹⁷ Berson, F. B., Mark C. Kuperwaser, Lloyd Paul Aiello, and James W. Rosenberg. "Visual requirements and commercial drivers." Retrieved March 21 (1998): 2002.



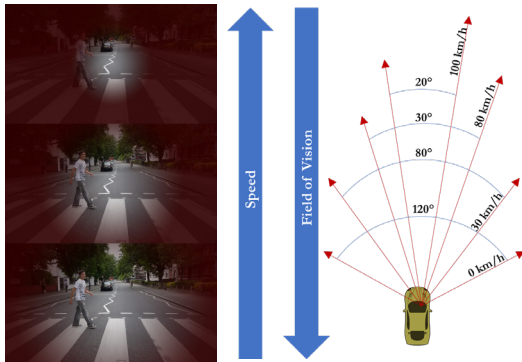


Figure 3. Decrease in field of vision with the increase in speed¹⁸

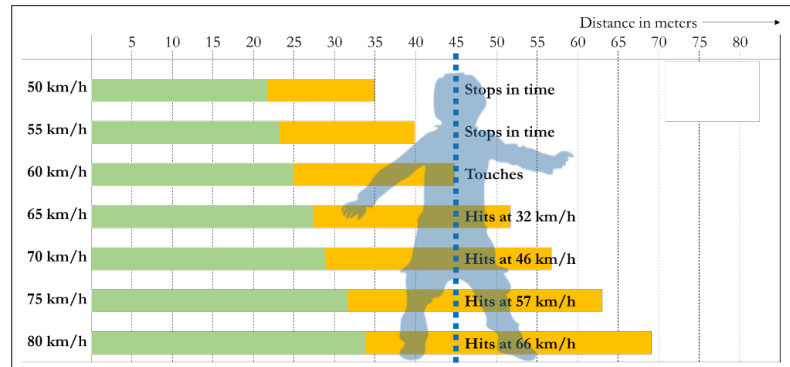


Figure 4. Stopping sight distance vs speed

The higher the speed of a vehicle, shorter is the time that a driver has to stop and avoid a crash. Vulnerable road users such as pedestrians, cyclists, moped riders, and motorcyclists have a high risk of severe or fatal injury when motor vehicles collide with them. The probability that a pedestrian will be killed if hit by a motor vehicle increases dramatically with speed. In Figure 5, the probability of a fatal injury for a pedestrian colliding with a vehicle is illustrated¹⁹. An increase in average speed of 1 kmph typically results in a 3% higher risk of a crash involving injury, with a 4-5% increase for crashes resulting in fatalities²⁰. Speed also contributes to the severity of impact. For example, a car occupant involved in a crash with an impact speed of 80 kmph, the likelihood of death is 20 times higher as compared with a car occupant with an impact speed of 30 kmph (Figure 6)²¹.

¹⁸ Toronto Complete Streets Guidelines: Making streets for People Placemaking and Prosperity. Link: www.toronto.ca/wp-content/uploads/2017/11/98a2-Chapter-8.pdf

Accessed on November 2019

Base image adapted from: Sparragus. Abbey Road Crossing; 2008.

Accessed on August 2019. Link: www.flickr.com/photos/sparragus/2620947537

¹⁹ World Health Organization. Speed management: a road safety manual for decision-makers and practitioners; 2008.

²⁰ World Health Organization. World Report on Road Traffic Injury Prevention.

Link: https://www.who.int/violence_injury_prevention/publications/road_traffic/world_report/speed_en.pdf?ua=1

²¹ World Health Organization. Speed management: a road safety manual for decision-makers and practitioners; 2008.



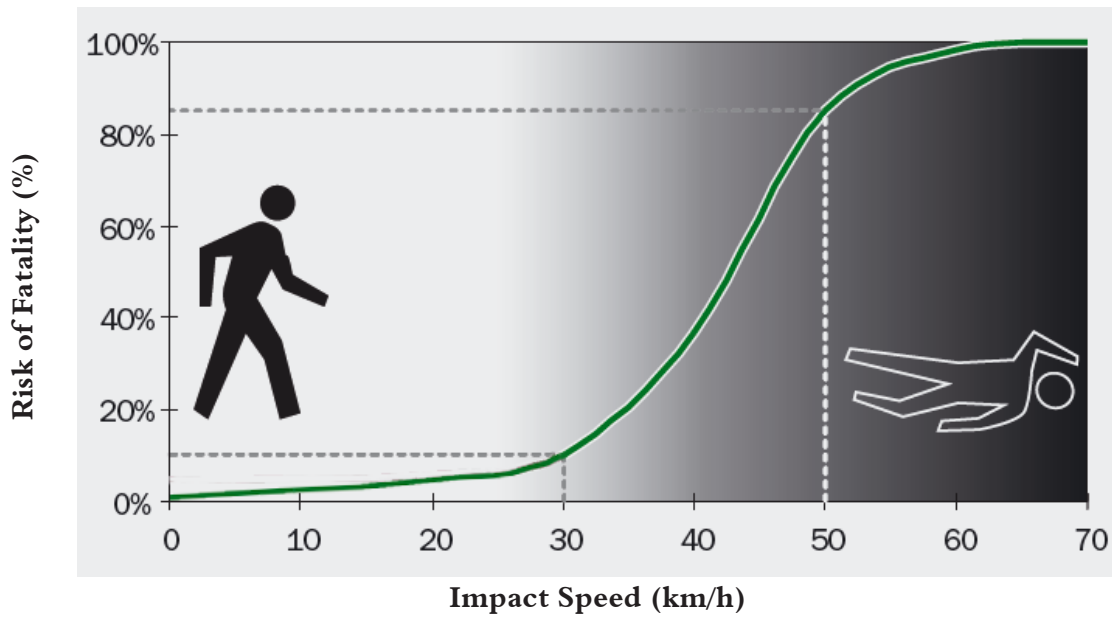


Figure 5. Probability of fatal injury for a pedestrian colliding with a vehicle

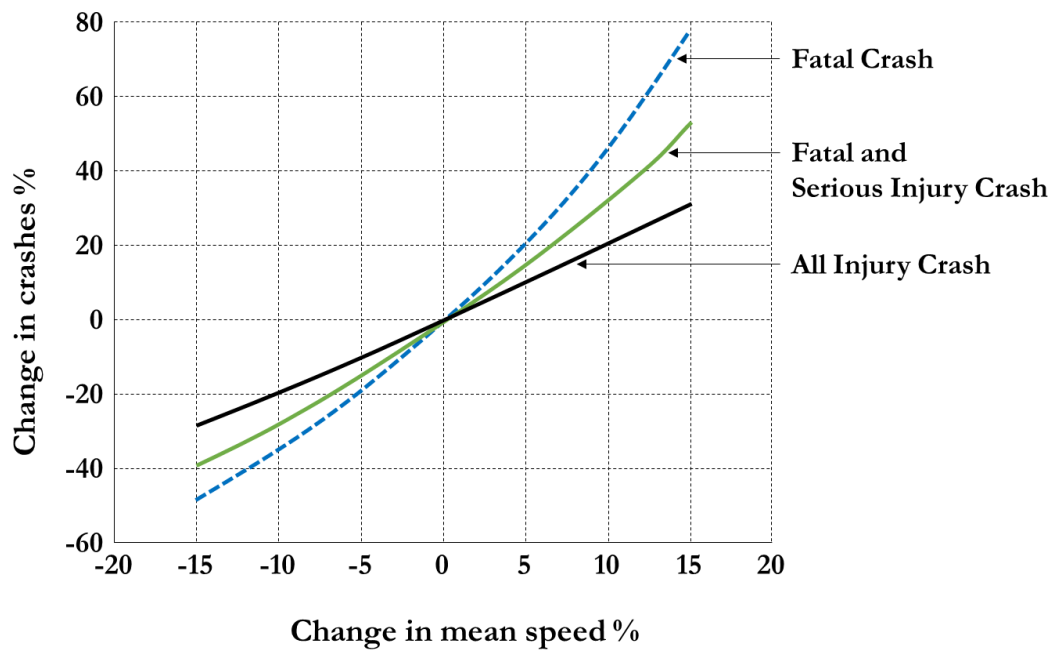
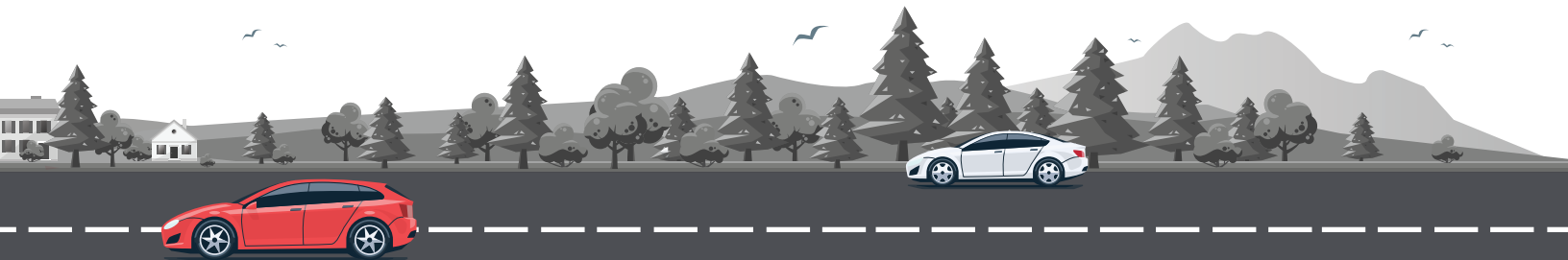


Figure 6. The relation between average speed increase and crash risk



The interaction of road users with road infrastructure and traffic systems differs in different land use and speed environments. It is common to find commercial activity outgrowing a designated site and spilling over onto adjacent land, including road space. Such spread of areas and associated activities ultimately lead to encroachment of pedestrian walkways, creating unsafe road conditions. Unsafe road environments and lack of safe infrastructure coupled with inappropriate speed can contribute to high fatality rates, which substantiates the need to determine the maximum speeds allowable for safe travel on the roadways. Though traditionally the permissible speed on a roadway is fixed on the basis of engineering design alone, adoption of injury tolerance criteria too has become an increasingly common trend worldwide for setting speed limits.

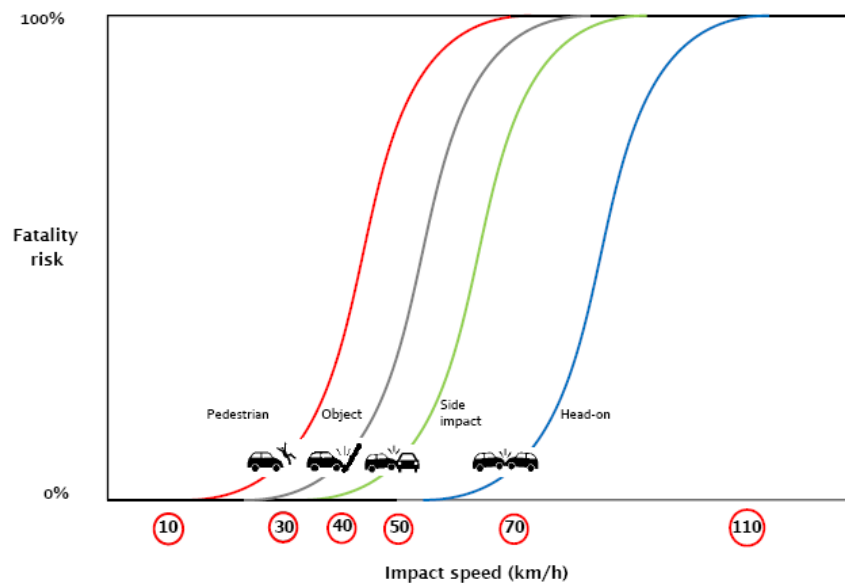


Figure 7. How a change in Impact Speed changes the Risk of Fatality, by different Crash Types²²

Figure 7 clearly illustrates the dramatic effect of speed on the risk of fatality in virtually any type of crash situation. The results strongly mandate safe speed limits for different road environments, which are commonly known as Safe System speed limits. On the graph, the “Safe System speeds” are set at a point that enables a 90 percent survival rate (or 10 percent fatality rate):

- ◆ 30 kmph for impacts with pedestrians (and other vulnerable road users such as cyclists)
- ◆ 40 kmph for impacts with solid objects
- ◆ 50 kmph for car-on-car side-impact crashes
- ◆ 70 kmph for car-on-car head-on crashes

²² NSW Centre for Road Safety (n.d.)

Link: <https://roadsafety.transport.nsw.gov.au/index.html>



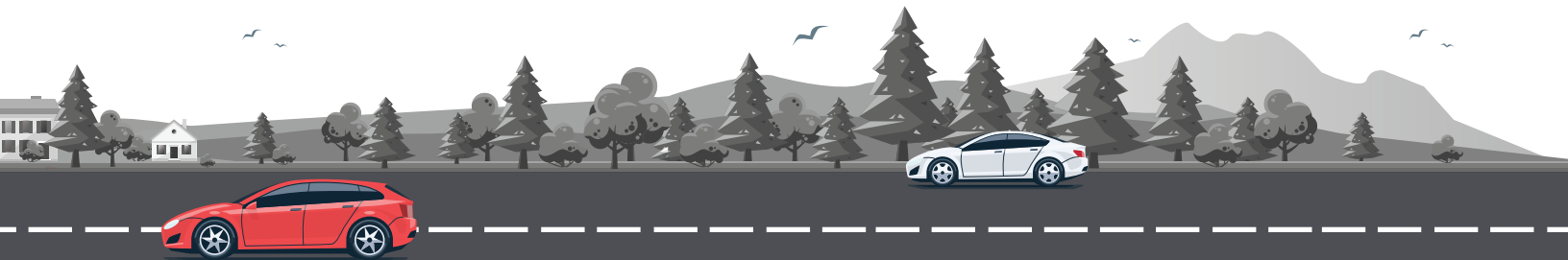
Even these limits may be considered too high to achieve a 90 percent survival rate, without considering inevitably much higher rates for serious injury, especially for vulnerable road users who have no physical protection. Since creating low-speed environments to provide a greater degree of safety for vulnerable road users is one of the major aims of the speed management program, physical speed restraint measures, along with infrastructure and engineering measures, are often added to achieve higher levels of road user compliance in addition to posting lower speed limits. With this treatment, the reduction in serious injuries to pedestrians could be very high²³ — greater than 70 percent even—with significant benefits for road users as well²⁴.

Drivers don't recognize the risks involved in speeding and as a result, improving compliance with speed limits and reducing unsafe driving speeds are not easy tasks. However, it is necessary to pay attention to the issue of speeding and take effective measures as the state can benefit significantly by focusing on this issue. Moreover, a focus on this issue with necessary policy interventions and effective implementation can produce significant benefits in the short run.

²³ Woolley, J., Stokes, C., Turner, B., & Jurewicz, C. "Towards safe system infrastructure: a compendium of current knowledge"; 2018.

²⁴ FHWA (Federal Highway Administration). Crash Modification Factors (CMF) Clearinghouse (database), FHWA, Washington, DC (accessed December 20, 2020)

Link: <http://www.cmfclearinghouse.org/index.cfm>



SPEED MANAGEMENT

According to the 6th global road safety performance targets²⁵, the proportion of vehicles travelling over the posted speed limit should be halved, and a significant reduction in speed-related injuries and fatalities should be achieved by the year 2030. In this regard, speed management embraces a large set of measures for balancing safety and efficiency of vehicle speeds on a road network²⁶.

The management of speed remains one of the biggest challenges faced by road safety practitioners around the world and calls for a concerted and multidisciplinary response. Setting and enforcing speed limits is a crucial component of comprehensive speed management. It is also a major part of an integrated road safety approach involving the protective quality of roads, roadside infrastructure and activities, vehicles, and human tolerance thresholds for fatal and severe injury. Speed limit setting has traditionally reflected attempts to achieve a balance between safety and mobility. However, countries that are committed to reducing road deaths and injury are shifting this balance in favour of safety. Some countries are now setting speed limits with reference to the limits of **human injury tolerance**, that is, to a level that will not usually result in death or serious injury to road users when crashes occur²⁷. At present, only 46 countries have speed limit laws that align with the best practices. However, the best practices were observed to be legalized and enforced only in high-income countries²⁸. Interestingly, the infrastructure facilities (particularly for NMT users) in these countries are superior to those in developing countries such as India. Also, the awareness and education of road users are also higher in these countries as compared to many other countries. This is in contrast to the scenario in India, where the traffic is highly heterogeneous, education and awareness of road users are low, NMT infrastructure needs significant improvement, and the speed limit laws are rarely aligned with the best practices either at the state or country level.

An effective Speed Management Program will typically distribute roles and responsibilities among different agencies. It is essential to build collaboration and coordination among these agencies addressing speeding and speed-related crashes. Coordinated speed management measures can reduce crash count by up to 40% and have significant impact on reducing the severity and socio-economic losses²⁹. Speed management ensures that road users operate at speeds that are safe and appropriate not only for users of motorized transport on the given roadway environment, but also for other roadway users, especially for VRUs. Thus, setting and enforcing appropriate speed limits giving due consideration to human injury tolerance is essential for improving safety. It is important to note that the driver's choice of speed is influenced not only by infrastructure but also by the laws of the country and the degree of enforcement.

²⁵ A long-term Care System, Global Road Safety Performance Targets

Link: www.who.int/violence_injury_prevention/road_traffic/road-safety-targets/en/

²⁶ European Conference of Ministers of Transport, and OECD/ECMT Transport Research Centre. Speed Management. OECD Publishing, 2006.

²⁷ World Health Organization. Speed Management: a road safety manual for decision-makers and practitioners; 2008.

²⁸ World Health Organization. Global status report on road safety 2018. Geneva: World Health Organization; 2018.

²⁹ World Health Organization. Speed Management: a road safety manual for decision-makers and practitioners; 2008.



CURRENT STATUS OF SPEED MANAGEMENT

A robust legal framework for managing speed is a fundamental requirement for achieving compliance with speed limits and reducing the growing instances of road crashes. The Motor Vehicles Act, 1988 governs various aspects of road safety in India. The Act has been amended to the Motor Vehicles (Amendment) Act 2019, whereby the provisions in the 1988 Act have been altered/ repealed/ modified/ augmented to promote safer roads for vehicles and road users. The Act provides for setting up of speed limits on various types of roads. It also lays down the maximum speed for different vehicle categories running on public roads. Further, the law specifies the penalties and fines for road users in cases of non-compliance.

In India, the speed limits vary from one state to the other and depend on the vehicle type. In April 2018, the Union Ministry of Road Transport and Highways recommended the maximum speed limits for passenger cars (that have less than eight seats³⁰) as 120 kmph, 100 kmph, and 70 kmph on Expressways, National Highways and Urban Roads respectively. These speed limits are higher when compared with the recommended safe system speeds as per global standards³¹ and also considering the prevailing roadway, traffic and control conditions. The speed limit recommended by the Union Ministry may, however, be considered as the upper limit, and the state and local administration have the authority to reduce the limit as per the prevailing conditions³².

It may be mentioned that WHO³³ categorized India in the group of countries with 'no speed limit laws or speed limit in urban areas > 50 kmph' (Figure 8). The speed limits are expected to be curbed near potentially risky areas such as shopping zones, schools, and hospitals. Moreover, the majority of the road stretches in both rural and urban areas are marked by mixed traffic, absence of lane discipline, uncontrolled access, roadside development and activities, and vulnerable road users including pedestrians and bicyclists. Therefore, keeping in mind the larger reality of traffic operations on Indian roads, there is a need to revisit and set appropriate speed limits on the basis of human injury tolerance for enhancing road safety. West Bengal, being one of the most populated states with intense roadside development and physical constraints (non-availability of land for creating NMT facilities, service roads, etc.), requires appropriate speed limits commensurate with human injury tolerance, on a priority basis to reduce road crashes and resulting fatalities in the state.

³⁰ Ministry of Road Transport & Highways, Government of India. Notification; New Delhi; April 6, 2018.

³¹ World Health Organization. Global status report on road safety 2018. Geneva: World Health Organization; 2018.

³² Section 112, The Motor Vehicles Act, 1988. New Delhi: Ministry of Road Transport & Highways, Government of India; 1988.

³³ World Health Organization. Global status report on road safety 2018. Geneva: World Health Organization; 2018.



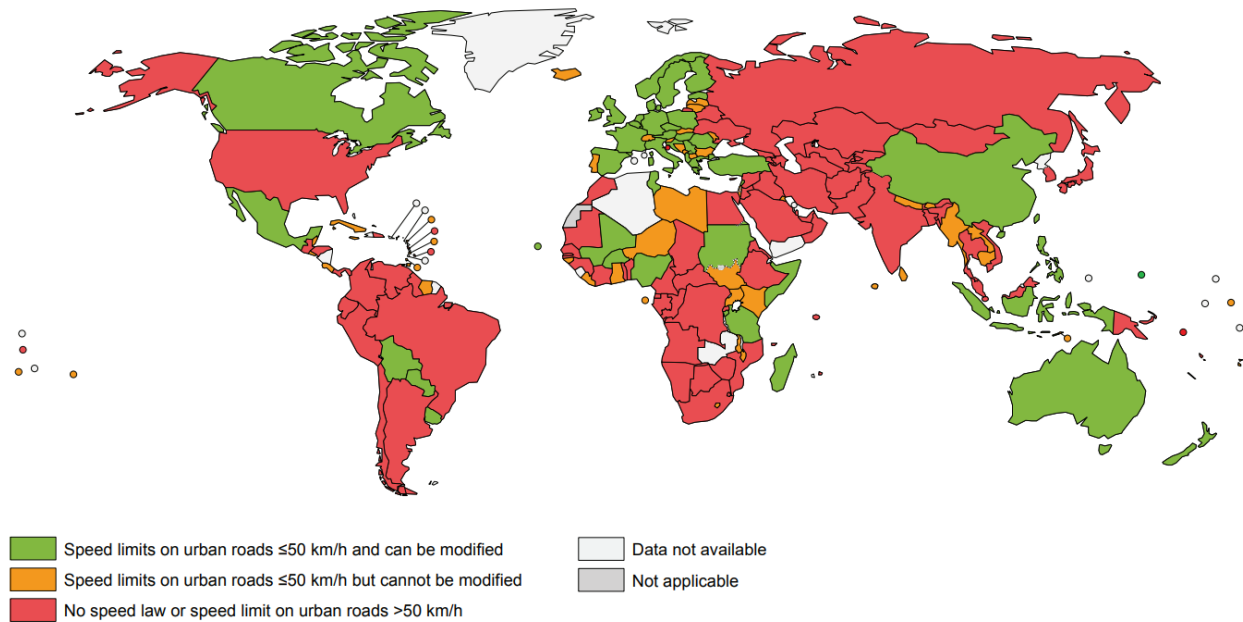


Figure 8. Countries with speed laws meeting best practice, 2017

Traffic calming measures are extremely important in the overall perspective of speed management. There are several Indian Roads Congress (IRC) guidelines which may be followed for implementing traffic calming measures in Indian scenarios. Some of these include:

- ◆ IRC: 99 Guidelines for Traffic Calming Measures in Urban and Rural Areas
- ◆ IRC: SP: 55 Guidelines on Traffic Management in Work Zones
- ◆ IRC: 67 Road Sign
- ◆ IRC: 30 Standard Letters & Numerals of Different Heights for Use on Highway Signs
- ◆ IRC: 35 Road Marking
- ◆ IRC: 65 Guidelines for Planning and Design of Roundabouts
- ◆ IRC: SP: 110 Application of Intelligent Transport System (ITS) for Urban Roads

The IRC documents present a set of guidelines which are designed to assist engineers in designing and implementing traffic calming measures as per the site conditions and requirements. IRC guidelines are updated from time to time based on new findings, knowledge and professional experiences.



Globally, police forces usually adopt enforcement methods based on anytime-anywhere approach to deter speeding on road networks. The intention behind this method is to clearly convey the message that speeding is illegal and unacceptable. However, the situation in India is widely different. A majority of the effort of the police force is diverted towards active work on roads to minimize traffic delays and congestion. The police play an important role in various domains (adding to their regular responsibilities of enforcement), which include awareness campaigns, public outreach, traffic management, traffic calming, etc.

Overall, there are needs and opportunities in India to improve enforcement and implement speed-related laws. Speed control legislation needs strict enforcement for better road safety results. Therefore, a revamping of the speed management practices would be helpful for the local authorities to enforce speed limits and play an effective role in lowering the number of speed-related crashes and the resulting fatalities. Speed management should be aimed to reduce the number of road traffic crashes and instances of grievous injury and fatality that result from such crashes. Several interventions are necessary to primarily limit vehicle speeds by employing measures, such as enforcement, engineering, and education.

In 2022, the State of West Bengal recorded 4,080 road crashes due to speeding³⁴, an increment of 2.3% as compared to the 2021 data; although the share of road crashes due to speeding increased by around 12.8% on the national level during the same period³⁵. The City of Kolkata, on the other hand, recorded a remarkable reduction in traffic rules violation related to speeding in recent years³⁶. This may be attributed to focused attention and strict enforcement by the Kolkata Traffic Police with respect to speeding and other violations. A statewide focus on speeding and enforcement would further reduce road crashes and fatalities to benefit the people of West Bengal.

It is needless to mention that speeding is a public health hazard and an effective speed management program shall help the State of West Bengal not only to reduce the road crashes and road fatalities but also to attain a much-improved livability and quality of life through multiple benefits, such as, reduced crash severities, safer streets to allow for various activities, reduced air pollution, and reduced congestion. Several policy interventions covering organizational aspects, safe speed limits for different types of roads, speed limit signages, engineering measures, audits, crashes recording and reporting, speed monitoring, enforcement, capacity building, and education and awareness are expected to help the state to handle the issues pertaining to speeding in an efficient manner across the state, and to reduce road crashes and resulting fatalities.

³⁴ Transport Research Wing. Road Accidents in India – 2022. New Delhi: Ministry of Road Transport & Highways, Government of India; 2023.

³⁵ Transport Research Wing. Road Accidents in India – 2022. New Delhi: Ministry of Road Transport & Highways, Government of India; 2023.

³⁶ Transport Research Wing. Road Accidents in India – 2022. New Delhi: Ministry of Road Transport & Highways, Government of India; 2023.



INTERVENTIONS

The following policy interventions are included to effectively manage speed and reduce the risks of speeding in West Bengal and attain global standards in road safety based on the principles of “Safe system” approach. Managing speeds is a public health issue and the entire focus of these policy interventions is on creating a system that protects all road users, given the high degree of human frailty. Some of the interventions outlined below have already been implemented by the State of West Bengal. However, for the comprehensiveness of the document, all these interventions are mentioned below.

Organizational Framework

1. For addressing the road safety issues in general, and the aspect of speed management in particular, a 3-tier organizational framework should be used which will include State Road Safety Council (SRSC), Lead Agency (LA), and District Road Safety Committee (DRSC). SRSC will be the apex body with overall administrative responsibilities regarding implementation of speed management policy; it will be chaired by the Chief Secretary and will include members of all allied departments such as Transport department, Police department, Health & Family Welfare department, Home department, Education department, Road Development authority, Urban/ Rural Local body, etc. The next level of the administrative body will be the LA which will be responsible for the day-to-day execution, monitoring, evaluation, etc. and will oversee more operational activities. It is also a multi-department committee like SRSC. The Lead Agency will be led by an officer nominated by the Transport department and it should comprise at least one dedicated member from all the relevant departments for administering road safety activities and speed management policy. Furthermore, external experts may also be included to this committee in order to provide necessary technical support to the State. To ensure similar coordinated and focused actions in different geographical areas within the state, DRSCs should be formed with a view of assessing needs, monitoring and executing activities at the district level. The DRSCs will be led by the corresponding District Magistrates. The DRSCs too may include road safety experts from academic/ research institutes and industries akin to the LA. It would also be desirable to include members from P&RD/ WBSRDA as well as from local municipal bodies (corporation/ municipality) in DRSC.

The State of West Bengal has already notified constitution of SRSC in terms of Section 215(2) of the Motor Vehicles Act, 1988 vide No. 1083-WT/TR/P/3M(RS)-6/14(Pt-I) dated 23.03.2015. The formation of LA has been notified vide No. 1193-WT/TR/P/3M(RS)-5/2016(Pt-VII) dated 15.03.2019. The State has also notified constitution of DRSC for each district of the State in terms of Section 215(3) of the Motor Vehicles Act, 1988 vide No. 1084-WT/TR/P/3M(RS)-6/14(Pt-I) dated 23.03.2015. Out of the 3 bodies, SRSC will be ensuring the highest level of co-ordination regarding speed management. The responsibilities of SRSC with respect to speed management include monitoring implementation of the long-term interventions, review of annual reports submitted by



the LA, conduction of yearly meetings involving the LA, utilization of the Road Safety Fund for short-term improvements, handling major administrative level decisions, etc. The responsibilities of LA include notification of the speed limits, review of proposals regarding requirements of physical speed control & electronic enforcement measures and review of corresponding post-implementation reports, conduction of meetings to discuss proposed short-term & long-term interventions, preparation of comprehensive status report about the short-term and long-term interventions adopted by the road development authorities, conduction of quarterly meetings with the DRSCs, taking part in training and capacity building of the officials of various departments engaged in speed management assignments, etc. Likewise, the responsibilities of DRSC with respect to speed management include monitoring all the district level planning and implementations regarding the interventions related to speed management, organizing various district level awareness programs for the allied departments, etc.

Safe Speed Limit

2. Safe speed limit should be set considering **road engineering, traffic engineering, and human injury tolerance** criteria. Safe speed from road engineering point of view should be suggested by the corresponding road development authority duly considering design speed/ 98th percentile speed, geometric deficiencies, if any (say, restricted sight distance, grade, sharp curve, etc.), terrain, road category, functions (as per functional classifications of roads in urban and rural areas), operating speed/ 85th percentile speed, road surface condition, etc. Often a lower speed limit is suggested due to the prevailing geometric deficiencies on the road. Safe speed limit in highways is generally kept higher than the MDR and village roads. The road development authority may also suggest suitable speed limits in construction zones or on temporary diversion roads during construction.

Due consideration should also be given to the traffic engineering aspects, especially vehicle characteristics, driver behaviour and available clear zone while setting a safe speed limit. The safe speed is a function of the traffic environment, namely traffic volume and mix of vehicles. It is extremely important to duly consider the human injury tolerance aspect (i.e., a speed which will not usually result in death or serious injury to road users when crashes occur) in deciding safe speed at locations where VRUs are present in an unprotected manner. Apart from reducing the fatality, a safe speed considering human injury tolerance will also bring down the number of crashes as this will enhance the opportunity for drivers to carry out necessary maneuvers avoiding crashes. As mentioned earlier, the 'Safe System speeds' correspond to 90 percent survival rate or 10 percent fatality risk rate under different potential crash scenarios (Figure 7).

The suggested safe speed limits considering human injury tolerance and traffic engineering aspects are mentioned in 'Annexure-A' and 'Annexure-B' for roads in rural and urban areas respectively. These recommendations will more often be used by the traffic police who have knowledge about the movement of VRUs, road user behavior, safety issues, etc., and are primarily responsible for carrying out traffic operations on a day-to-day basis.

The minimum of the speeds as suggested by road development authority and as given in Annexure-A/



Annexure-B should be adopted as the safe speed limit for a stretch of road. Various aspects duly considered in suggesting safe speed limits in 'Annexure-A' and 'Annexure-B' include type of road (urban or rural), carriageway configuration (divided/ undivided, number of lanes, etc.), level of access control, land use (residential/ markets/ school catchments/ localized semi-urban/urban developments, etc.), exposure to pedestrians and/or other VRUs, history and nature of crashes, vehicle composition and available clear zone.

There is limited research available on safe speed limits in the Indian context. Therefore, the safe speed limits for different scenarios have been suggested duly considering (i) roadway, traffic and control conditions prevailing in India, (ii) suggested speed limits by various global organizations like World Bank³⁷ and WHO³⁸, (iii) speed behavior and expectations of drivers, as observed from field studies and interviews of drivers carried out by IIT Kharagpur, and (iv) ease of enforcement. A few key aspects duly considered in suggesting safe speed limits are:

- In India, heterogeneity exists across motorized vehicle categories (say, car, bus, motorized three wheelers, etc.), and safe speed is expected to be a function of vehicle category. But, heterogeneity also exists among vehicles within a vehicle category. For example, we have new trucks as well as old trucks, and the vehicle characteristics and safe speeds are unlikely to be the same for all trucks. The vehicle conditions also vary widely. The safe speeds for a heavily loaded truck and an empty truck are unlikely to be the same. Majority of Indian roads are still undivided roads (with two-way traffic movements), and vehicle category wise speed limits may eventually invite safety issues as vehicles from different vehicle categories share the same lane. Even for multilane roads, enforcement of vehicle category wise speed limit is challenging under the present scenario. Therefore, proper lane usage (e.g., slower vehicles of all categories travelling on left lane, use of right most lane for overtaking only rather than travelling continuously, etc.) is considered extremely important for achieving higher safety and higher mobility on multilane divided highways.
- For high-speed road facilities (speed limit 80 kmph or more), provision of service roads on both sides is mandatory for complete segregation of non-motorized and slow moving local motorized vehicles from the through motorized traffic. The service roads will facilitate accessibility function with respect to the present as well as future developments in the vicinity; and help to retain the mobility function of these high-speed facilities in the future. Provision of safe crossing facilities (at-grade or grade separated) is mandatory for non-motorized and slow moving local motorized vehicles on all such high-speed facilities.

³⁷ World Bank (2019). Guide for Road Safety Opportunities and Challenges: Low- and Middle-Income Countries Country Profiles. Washington, DC., USA: World Bank.

³⁸ A long-term Care System, Global Road Safety Performance Targets.
Link: www.who.int/violence_injury_prevention/road_traffic/road-safety-targets/en/

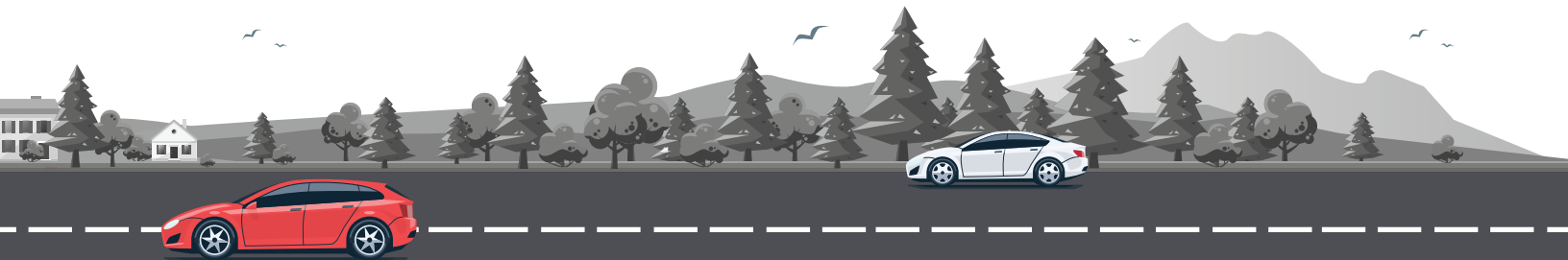


- Frequency of occurrence of speed restriction zones (say, market areas, schools, residential areas, etc.) is high on many highway sections in a densely populated state such as West Bengal. The data collected by IIT Kharagpur clearly indicate that drivers have minimum expectations to travel uninterruptedly once they attain a high speed before decelerating again to encounter the next speed restriction zone. The expectation depends on vehicle type, road, roadside, driver and speed.
- Design speeds for both rural and urban roads are decided based on functional classification of roads. However, often the intended (as per functional classification) and actual use of roads in both urban and rural areas are different. For example, for a segment of National Highway passing through a market area, the actual use is not as per the functional classification. Similarly, for a segment of urban arterial with significant movements of pedestrians along and across the road, and presence of parked vehicles, the actual use is again not as per the functional classification. Therefore, safe speed limits as recommended in Annexure-A/ Annexure-B are not defined as per the functional classification.

Several road stretches in rural areas have single/ intermediate lane carriageways. Even some of the State highways in West Bengal are also having intermediate lane carriageways due to physical constraints. Speed limits from road engineering point of view are not established on many such sections, and information related to design speed, 85th percentile speed, radius of curve, etc. are also not readily available. On such stretches, safe speed limits from a road engineering point of view should be established based on road geometry. Till the time the safe speed limits are established for such single lane and intermediate lane roads, the following safe speed limits may be considered from the road engineering point of view.

Terrain	Sight Distance	Safe Speed Limit (kmph)
Plain/ Rolling	Available	40
Plain/ Rolling	Restricted	30
Hilly	Available	30
Hilly	Restricted	20

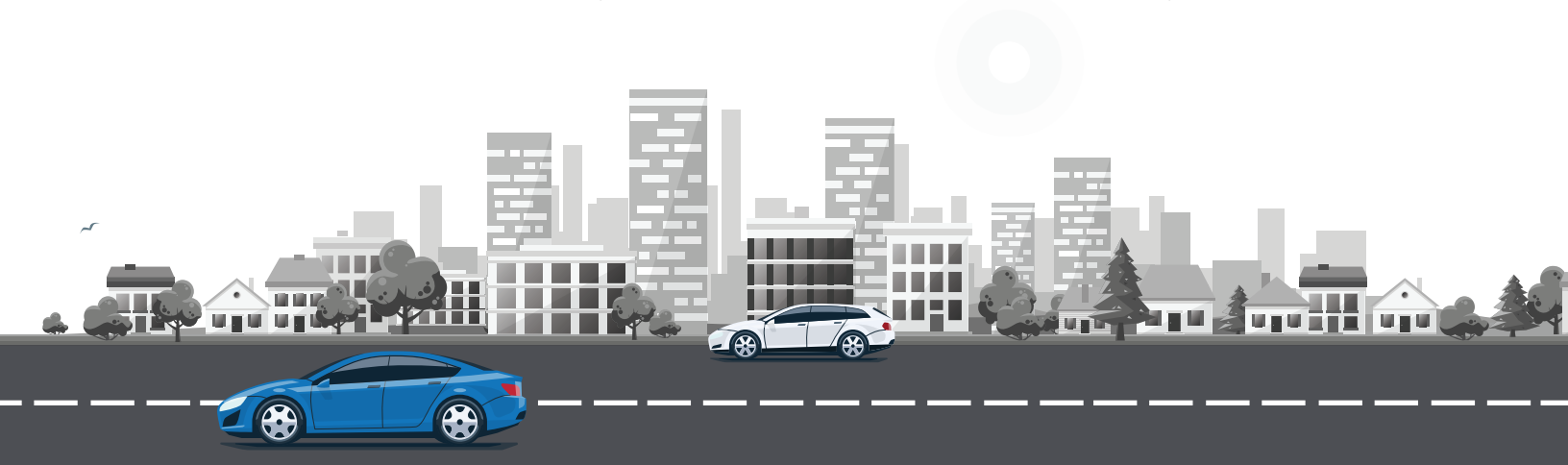
- Often, the duration of roadside activities, and movement of pedestrians & other NMT users is restricted. Say, movements of school children occur only during school opening and closing hours. Similarly, the roadside market activities generally occur only during morning and evening hours. Therefore, the use of Variable Message Signs (VMS) should be encouraged on priority corridors to set speed limits dynamically over time: a lower speed limit when it is necessary in the presence of VRUs and a higher speed limit during other hours. In the absence of VMS, only a single speed limit should be set during all hours as mentioned in 'Annexure-A' and 'Annexure-B'. The safe speed limit is also a function of traffic volume and therefore, might be lower under high volume to capacity ratio. Similarly, under some extreme conditions (say, during rains, fogs, etc.), the safe speed limit might be even lower than that recommended in 'Annexure-A' and 'Annexure-B'. Therefore, drivers must apply their discretion and bring down the speed under such conditions.



4. Motorcycles and motorized slow-moving vehicles are deficient in terms of vehicle characteristics/ engine power as compared to other motorized vehicles such as buses, trucks and cars. However, often these vehicles are also found on dual carriageways of National and State Highways along with other vehicles. On such stretches, either motorcycles and motorized slow-moving vehicles should be banned or a separate dedicated lane should be provided for these vehicles, and this must be enforced by the police. Wherever dedicated lane cannot be provided, two-wheelers and slow-moving motorized vehicles (e.g., tempo, toto, etc.) must travel on the paved shoulder (if available) or adjacent lane only. These vehicles are expected to travel at a slow speed which is commensurate with their vehicle characteristics.

Speed Limit Signage, Markings and Delineators

5. Speed limit should be conveyed to road users through designated road signs as it plays a crucial role in indicating the road hierarchy. Road markings and delineators are also important road appurtenances which guide the traffic along the alignment of the road and help to reduce crashes. The road development authority needs to ensure that the road signs are designed and installed strictly as per IRC: 67 "Code of Practice for Road Signs", road markings are provided as per IRC: 35 "Code of Practice for Road Markings" and delineators are installed strictly as per IRC: 79 "Code of Practice for Road Delineators". The road development authority should carry out the installation of road signage in consultation with local traffic police who have valuable experiences about movement of pedestrians, bicyclists, and the nature of safety issues. VMS, if any, should be installed as per IRC: SP: 085 "Guidelines for Variable Message Signs".
6. The required spacing of speed limit signs may be decided based on following criteria. Several criteria may be applicable for a road stretch. In such cases, speed limit signs should be placed to satisfy all applicable criteria as per IRC: 67.
 - a. For stretches of highways without any change in roadway, traffic, and control condition, one speed limit sign in every 10 km should be placed. All the installed signages should adhere to the IRC: 67. However, a few additional signages should be provided to ensure at least one speed limit sign at every 10 km, so that it will draw attention of the drivers and remind them of the speed limits.
 - b. There should be a speed limit sign after every major intersection/entry point, even if there is a speed limit sign before the intersection/entry point. This is to ensure that every vehicle entering the main road gets notified about the legal speed limit.
 - c. There should be a speed limit sign whenever there is a change in legal speed limit. For example, if the speed limit changes from 80 kmph to 30 kmph due to the presence of a school and back to 80 kmph beyond the school zone, then a speed limit sign should be posted before the start of the school zone and at the end of the school zone.
 - d. In order to preclude sudden drops or hikes in speed limit (such as sudden change of speed limit from 70 kmph to 30 kmph), sufficient length of transition zone(s) should be provided to bring down the speed with



a comfortable deceleration rate. Normally, for every 20 kmph change in speed limit, one transition zone of sufficient length should be provided. So, for example, for a sudden drop of speed limit from 70 kmph to 30 kmph, two consecutive transition zones having sufficient lengths need to be provided in between – (i) to reduce the speed limit from 70 kmph to 50 kmph, and (ii) to reduce the speed limit from 50 kmph to 30 kmph. Intermittent speed limit boards may be placed to avoid sudden drops or hikes in speed limit.

- e. There should be a minimum of one posted limit sign within a restricted speed zone. For a longer stretch of restricted speed zone (say, a large market or highway passing through built-up area, etc.), posted speed limit signs should be repeated every 1 km. A restricted speed zone should also be indicated well-in-advance with proper warning signs.

Engineering Measures

7. In the Indian scenario, along with speed limit signage, engineering interventions such as traffic calming measures are necessary for efficient speed management. A combination of various engineering measures specific to the road and traffic environment should be used to effectively manage the speed. The road development authority should be responsible for the selection and implementation of appropriate engineering measure(s) to manage speed in an effective and efficient manner. The Local traffic police must be consulted as they are responsible for day-to-day traffic management. Engineering interventions may be selected as per the relevant Indian Roads Congress guidelines (such as IRC:99 “Guidelines for Traffic Calming Measures in Urban and Rural Areas”).
8. Special emphasis on speed management should be given to roads passing through market areas, schools, hospitals, etc., using individual or combination of traffic calming measures. Besides speed limits, modifications in infrastructure plan and design features should be used to produce a ‘self-explaining road’. Road development authority should be continuously involved in improving the road engineering aspects to make the roads safer and of forgiving nature.
9. Roads passing through work zone(s) need more focused attention with respect to speed management measures. The work zone road safety interventions should be as per the IRC: SP: 055 “Guidelines on Traffic Management in Work Zones” which specifies the basic principles and purpose of the work zone traffic management plan as well as the traffic control and speed management devices along with their specifications like standard size, shape, colour, retro-reflection, material, placement, etc.

Audit of Existing Speed Management Measures and Implementation

10. Several speed limit signs already exist but have several deficiencies and lack of consistency in terms of speed limit, characteristics of signs (e.g., shape, size, color, material, etc.), position of signs, installations, etc. All these need to be corrected on a priority basis by carrying out extensive audit across all the roads in the state. Implementation of these signs should be as per the relevant IRC guidelines.



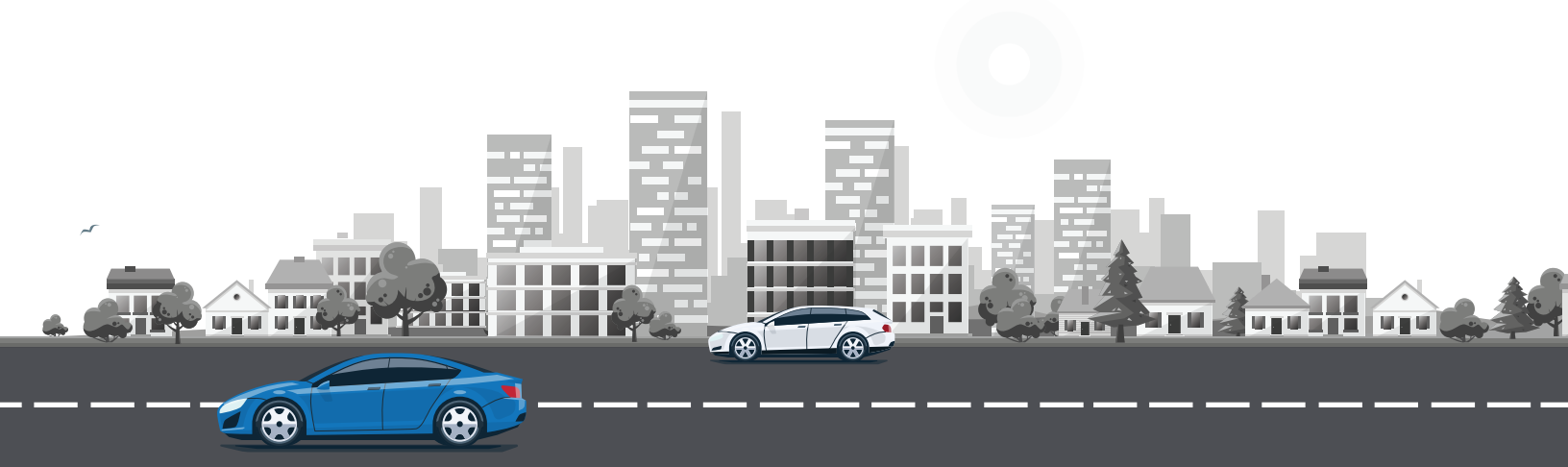
11. Several speed management and traffic calming measures across all types of roads in the State such as speed humps, rumble strips, etc. which are already existing are inappropriate in many ways (e.g., location not suitable, design inappropriate, no marking, no advance warning signs, etc.) and therefore, they are not effective and in many cases are acting as safety hazards. In order to determine their appropriateness in terms of suitability, design, and placement, extensive audit of the existing speed management and traffic calming measures across all types of roads in the State is very necessary on a priority basis. Implementation of these measures (along with the associated markings, delineators, etc.) should be as per corresponding IRC guidelines.

Crash Data Recording and Analysis

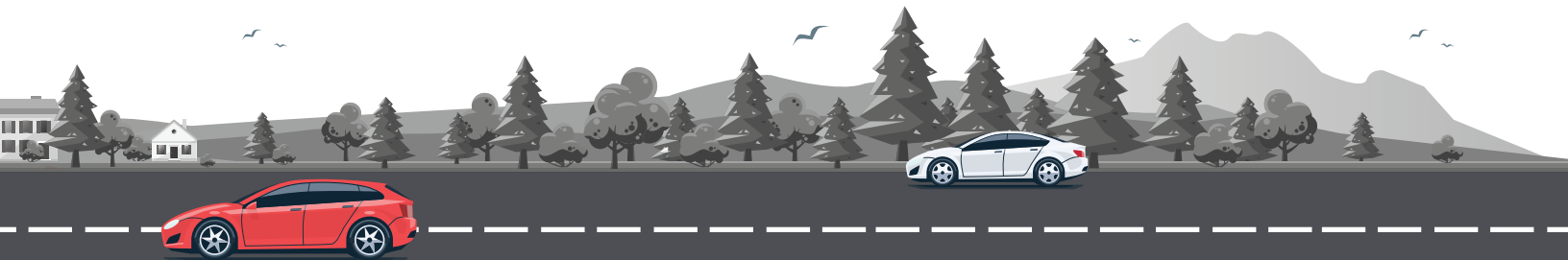
12. Crash data should be recorded and analyzed scientifically as per the Section 135 of The Motor Vehicles Act, 1988. Every fatal/major crash location should be visited by a team of experts with representations from police, road development authority and motor vehicles department. Also, every such crash should be analyzed duly considering all relevant driver, road and vehicle related factors. At present, the crash data is recorded as per the format proposed by the Ministry of Road Transport and Highways (MoRTH). However, it is now strongly recommended to use Integrated Road Accident Database (iRAD) for comprehensive crash data collection. Crash data recording in iRAD includes all relevant factors & uses the database developed by all concerned authorities. Furthermore, location specific engineering deficiencies, if any, found during the data collection must be rectified with due priority. At the initial stage, iRAD may be adopted for all the NHs, SHs & MDRs, as well as for rural roads having annual traffic volume of more than 1 MSA or having a history of high crash frequency. A capacity building is necessary for all officers of police, transport, and road development departments who will be involved in crash recording & reporting so that they understand each aspect to be studied and data to be recorded in case of a road crash; this may be done in combination with iRAD training programmes.
13. The database should be analyzed to identify the blackspots and other critical locations, understand the effects of speeding and identify the crashes with VRU involvement, so that necessary speed management measures may be applied for reducing fatalities/ crashes in order to ensure effective implementation of speed management policy. The annual crash reports and statistics should be made available to the public domain.

Electronic Speed Monitoring & Enforcement

14. Speed monitoring and enforcement plays a vital role in the context of Speed Management. The traffic police department should carry out this task at majority of the high priority corridors such as the National Highways and State Highways. Along with that, specific critical locations, where speed management is required, such as market area, school zones, hospitals etc., should also be covered under the monitoring and enforcement protocol. It is recommended to gradually adopt the electronic enforcement and monitoring system for widespread and active monitoring and enforcement. The manifold advantages of electronic techniques include accurate detection of violation, 24x7 monitoring capability, and the prosecution will be evidence based which will ensure transparency of prosecution and increase public acceptability.



15. To adopt electronic monitoring and enforcement, an implementation framework covering all aspects of electronic monitoring and enforcement needs to be developed. The implementation framework should include technical specifications of the equipment to be used and their calibration, proper functioning and calibration certificate of the equipment, location for installation, transfer of the collected data to centralized data system (may be police district wise or urban area wise), linkage with other relevant databases such as e-Vahan, issuance of e-challans with details about violations and evidences, etc. The citizens should be informed about the implementation of the electronic enforcement techniques. Use of Intelligent Transport systems, especially Advanced Driver Assistance Systems (ADAS), such as Intelligent Speed Adaptation (ISA) should also be encouraged by providing necessary equipment and infrastructure to the vehicles.
16. It is difficult to cover all the NHs and SHs of West Bengal at a time under the electronic monitoring and enforcement framework. Therefore, the automatic enforcement and monitoring process will be done on some prioritized roadways in a stage-wise approach. During the process of stage-wise implementation of speed monitoring and enforcement with fixed electronic infrastructure and facilities, the police department will monitor the other roads with mobile equipment. This equipment may be in the form of hand-held equipment and/or body wearable equipment and/or vehicle mounted equipment. The police personnel should carry out enforcement with these equipments following the “Anytime-Anywhere” approach. A detailed implementation framework including technical specifications of the equipment to be used and their calibration, proper functioning and calibration certificate of the equipment, point of installation – hand-held or body wearable or vehicle mounted, and their integration needs to be developed.
17. Speed governors should be installed uniformly throughout the state on all school vehicles and public buses to ensure that these vehicles do not exceed safe speeds under any circumstances. For buses operating within urban areas and all school vehicles, the maximum speed limit may be set to 40 kmph. For buses serving non-urban catchments, the maximum speed limit should be restricted to 50 kmph. For high-quality long-distance buses, the maximum speed limit may be set to 80 kmph. The speed limit may be lowered, if a specific vehicle category is found to get involved in crashes more frequently than other vehicles.
18. The Ministry of Road Transport & Highways (MoRTH), Government of India (GoI) had issued a notification vide G.S.R. 1095(E) dated 28.11.2016, as published in the Gazette of India, and inserted rule 125H in the Central Motor Vehicles Rules (CMVR), 1989, wherein the provision of Vehicle Location Tracking Device (VLTD) and emergency button became mandatory with effect from 01.04.2018 for all public service vehicles (PSV) as defined under clause (35) of Section 2 of the Motor Vehicles Act, 1988. Accordingly, the Governor of West Bengal has also issued notification, vide Notification No. 4267-WT/TRD-14011/5/2022 Dated: 14.11.2022, and directed all transport vehicles (i.e., the commercial vehicles) should be equipped with VLTD and one or more emergency buttons at conspicuous position in public interest. The VLTD may be used advantageously for enforcement of speed management over a stretch of road.



19. Vehicle monitoring and speed monitoring systems should be centralized and standardized to facilitate sharing of data among various agencies for policy-making, research and development. The database should cater to both temporal and spatial aspects. Data storage and privacy issues should be considered while developing the database. GRSP GRSF guide³⁹ may be of use in this regard.
20. Transport department should adopt random on-road checks of vehicles across the state covering all categories of road using an accepted standard protocol, to ensure that the vehicles are safe for operation at a particular speed limit.
21. The traffic police should document and establish the procedure and methods of speed enforcement that they have adopted or shall adopt in their jurisdiction as per the performance targets with a focus on several important aspects of enforcement, viz., hours and frequency of enforcement activity, randomness, and unpredictable nature of their approach.
22. Levying penalties and fines is a method of deterrence; however, many drivers are from marginal sections of the society. Therefore, to reduce the financial burden of monetary punishment, equivalent methods of non-monetary enforcement may be explored keeping in mind the socio-economic perspective of price-sensitive Indian citizens. Prior to implementation, the non-monetary methods of enforcement should be evaluated based on several aspects, viz, safety implications, effectiveness, duration, complexities, etc. Driver demerit systems and mandatory driver license suspension for extreme speeds have been found to be successful methods in several countries. Graduated penalties whereby sanctions become more severe as speeds rise beyond the posted speed limit may also discourage drivers from speeding. The suitability and applicability of such methods in the Indian context may be explored.

Capacity Building

23. The capacity building of the DRSCs is very important in the context of the overall improvement of Road Safety. Training to DRSCs should be carried out to give an overall orientation of the road safety scenario, various approaches to minimize the road crashes and fatalities, the role of accurate crash data etc. They should also have a clear knowledge about the various activities that they need to carry out in order to improve the road safety scenario of the state. The training of the DRSCs should be conducted by involving external agencies who have the expertise in this context.
24. Appropriate orientation and training of police personnel should be done periodically to ensure that every police personnel is involved in traffic management related decision making or field activity only after proper orientation and training. Senior police officers are generally involved in policy decisions while a large number of police personnel is actually deployed in the field for day-to-day traffic management works. The training module should be made separately for these groups as per their involvement and duties. The preparation

³⁹ Job, S., Cliff, D., Fleiter, J.J., Flieger, M., & Harman, B. (2020). Guide for Determining Readiness for Speed Cameras and Other Automated Enforcement. Global Road Safety Facility and the Global Road Safety Partnership, Geneva, Switzerland.



of course materials for the training may be entrusted to an institution having expertise in relevant areas. The course material should include aspects such as (i) understanding the safe system approach to improving road safety outcomes, (ii) the risks posed by speeding, (iii) data-led speed enforcement approaches, (iv) safety of police personnel during roadside enforcement operations, etc. The external experts may also be involved in the training of trainers i.e., training of the senior/high ranked police officers. Subsequently, the senior police officers should take the lead role to train the other police officers and the civic volunteers who are actually deployed in the field for day-to-day traffic management works. External experts may also be included for delivering one or two guest lectures in these training programs as and when required.

25. Field personnel who are actively involved in speed enforcement should receive special training on the Standard Operating Procedures for speed enforcement. It should include the ways to intercept and interact with violators and offenders on-road in a dignified manner and with a positive attitude to convey the appropriate message. This would bring a positive change in public attitude towards police actions and improve the respect and trust towards police enforcement. This training should be carried out periodically, in-house. Such trainings is applicable to both traffic police and civic volunteers who are involved in active on-road duty.
26. Drivers who are involved in operations of emergency vehicles and VIP vehicles should receive specialized training and be guided by specific procedure and protocol to improve their awareness about the dangers of high-speed driving. An academic institution with necessary expertise maybe involved to prepare the course material of the training program. The police department should disseminate this training at different times, whenever necessary.
27. Safe infrastructure and safety of road users are primarily the responsibilities of road development authorities. But, traditionally road development authorities such as PWDs have appointed engineers who have knowledge and expertise in pavement design, bridge design, and other structural aspects. These authorities generally lack engineers who have expertise in traffic engineering and road safety. This gap needs to be addressed through proper recruitment policy to provide a place for traffic and safety engineers in these organizations. In parallel, regular training to engineers already engaged in these organizations is also necessary for capacity building related to road safety. Initially, the external experts may be involved during the training of trainers i.e., the senior/high ranked engineers. Subsequently, the training may be conducted in-house where the trained senior engineers will train the other engineers of the department. In these trainings, the external experts may be involved for delivering one or two guest lectures as and when required

Education & Awareness

28. Education and awareness of different road user groups are necessary with a view to create a push-pull strategy to make them aware and understand the implications of speeding and also the Government policy on speed enforcement. Education/awareness and enforcement should go hand-in-hand. The awareness campaigns should be strategic and targeted to at-risk groups, viz., trucks, two-wheelers, buses, etc. A combination of different modes of training should be adopted to effectively impart education to the target user groups.



29. An added emphasis should be given on developing and testing road safety knowledge before issuing a driving license. Digital platforms and technology enhanced learning should be used advantageously to impart road safety knowledge/education among driving license aspiring candidates. The knowledge test should be done online and must include questions related to speeding. Only those who demonstrate adequate knowledge on safe driving should qualify for subsequent test and issuance of driving license.
30. The administration and news media should work together with a focus on why speed enforcement is very important to public health outcomes and why it should be a priority, so that the media support speed management and explain the necessities to the public as and when introduced. Media-focused skill-building workshops shall be helpful to impart media training on aspects of public awareness and education related to road safety, in general and speed management and enforcement, in particular.
31. Both print and television media should be actively involved in raising awareness among all categories of road users related to safe driving and maintaining safe speeds. Recommendations related to safe driving principles should be spread across the community through print media (i.e., leading newspapers) and electronic media (i.e., periodic broadcast/short events through news media channels). There should be a focus on speeding as a public health issue and enforcement is a means of protecting the public so that the general compliance towards speed enforcement is improved.
32. The awareness among the people related to road safety, safe speeds and safe driving principles should be expanded through community-based periodical educational campaigns related to safe speed and safe driving principles. The community's attitude to the implemented speed management measures needs to be comprehended through regular interviews.

Pilot implementation of Speed Management

33. Pilot stretches across different road categories in both urban & rural areas should be selected for the implementation of specific measures related to speed management. Total 8 stretches should be selected, one from each – NH, SH, MDR/ODR and Village Road from rural roads and Arterials, Sub-Arterials, Collector and Local Streets from the urban roads. These pilot stretches should be used as live examples and case studies to illustrate the entire process to the stakeholders involved in speed management through effective capacity-building and specialized training programmes. Speed monitoring should be carried out at the pilot stretches before and after the implementation of speed management measures to understand the road user compliance and the cost-effectiveness of the measures. The experiences gained from the pilot projects will be used to fine-tune various recommendations, as necessary, related to speed limits and overall speed management



ROADMAP

In order to reap the benefits of the policy interventions outlined in the previous section, it is necessary to carry out a few key activities. These activities are identified and discussed in this section under different key areas of intervention. For each activity, the detailed description, organizational responsibilities and targets are mentioned. The speed management related interventions such as short-term improvements of roads, enforcement interventions, capacity building programmes, piloting, etc. may be funded by the Lead Agency from the available road safety fund. The infrastructural interventions such as (i) development of PUP, VUP, FOB, grade separators etc., (ii) development of service roads, (iii) re-design of intersections may be taken up further by road development departments for preparation of the Detailed Project Report (DPR) and subsequent implementation as per the current practice.

Safe Speed Limits, Signages, Road Markings & Delineation, and Traffic Calming Measures

1. Safe Speed Audit (SSA) on all roads for recommending appropriate speed limits as per the present document and corresponding traffic signs, road marking, delineators and traffic calming measures as per Indian Roads Congress (IRC) guidelines

Description:

- (i) Safe Speed Audit of all roads in the State should be conducted in order to review existing posted speed limits & related signages, road markings & delineation, and traffic calming measures. Special emphasis should be given during the audit at the sensitive locations such as schools, colleges, hospitals, market area, religious places, etc.
- (ii) Recommendation of appropriate speed limits under different traffic scenarios should be set forth as per the present document followed by appropriate road signages (IRC:67), road markings (IRC:35), delineators (IRC:79), and traffic calming measures (IRC:99). For work zones, interventions should be as per the IRC: SP: 055.
- (iii) Recommendations should be made regarding removal/ replacement of existing signages, markings, delineators, and traffic calming measures which are non-conforming to the present document or corresponding IRC guidelines.
- (iv) A report should be prepared based on (i), (ii) and (iii).

Responsibilities:

- (i) Lead Agency will be responsible for the overall planning and monitoring of the work.
 - (ii) DRSCs should carry out the work and report to the Lead Agency periodically. The police department and concerned road development department (e.g., PWD, UD, P&RD, etc.) should jointly lead the work at district level. If required, an external consultant/ academic institute may be entrusted by the Lead Agency to carry out the work in consultation with the DRSCs
- (i) and (ii) should be done as a one-time work to cover the entire road network in the State.

Target:

- (i) For NH & SH stretches in the state, auditing and subsequent recommendations should be done within 2 years covering 50% of road length in each year.
- (ii) For MDR, ODR, VR, and Urban Road stretches in the state, auditing and subsequent recommendations should be done within 5 years, covering 20% of the road length in each year.



2. Installation of new speed limit signages, and associated marking, delineation & traffic calming measures, and removal/ replacement of existing signages, markings, delineators, and traffic calming measures which are non-conforming to the present document or corresponding IRC guidelines

Description:

- (i) Installation of new speed limit signs, related warning signs, road markings, delineators, and traffic calming measures should be done as per SSA recommendation.
- (ii) Removal/ Replacement of existing signages, markings, delineators, and traffic calming measures non-conforming to the present document or corresponding IRC guidelines should be done as per SSA recommendation

Responsibilities:

- (i) The work should primarily be performed by the concerned road development department in consultation with the police department, and it should be checked and reported to the Lead Agency by the DRSC. The installation of road engineering interventions (speed limit signs, related warning signs, road markings, delineators, other road furniture, etc.) should be the primary responsibilities of the road development department.
- (ii) Any specific long-term infrastructural intervention (if needed) should be taken up further by the concerned road development department for DPR preparation and implementation as per the current practice.

Target:

- (i) For NH & SH stretches in the state, installation & removal/ replacement of signages, markings, delineators, and traffic calming measures should be completed within 3 years covering 33% of the road stretches in each year.
- (ii) For MDR, ODR, VR, and Urban Road stretches in the state, installation & removal/ replacement of signages, markings, delineators, and traffic calming measures should be completed within the next 5 years.



Crash Data Recording, Analysis, Audit and Interventions

3. State-wide adoption of iRAD for crash data recording

Description:

- (i) On a priority basis, iRAD should be implemented in all the districts for collecting & reporting of crash data in a more comprehensive manner.
- (ii) Training programmes should be conducted for effective implementation of iRAD in all the districts.

Responsibilities:

Lead Agency should organise necessary training and orientation programmes involving police department, road development department, transport department, and health & family welfare department.

Target:

Within 1 year from the notification of this document on Speed Management Policy Interventions and Roadmap.

4. Crash data analysis and identification of critical locations with respect to speeding

Description:

- (i) Analysis of the crash database of the past 3 years to identify blackspot locations, percentage of crashes due to speeding in different districts and in the state as a whole, percentage of crashes involving VRUs in each district and the state as a whole, ranking of the districts with respect to the percentages, fatality rates, etc.
- (ii) Identification of top 10-20 fatal crash locations in each district where speeding is the primary cause of crash/ fatality.
- (iii) Identification of top 10-20 fatal crash locations in each district based on the number of pedestrian fatalities (irrespective of the recorded cause of crash).
- (iv) Identification of top 10-20 fatal crash locations in each district based on the number of bicyclist fatalities (irrespective of the recorded cause of crash).

Responsibilities:

This work should be performed by the police department and monitored by DRSC. Alternatively, the work may be entrusted to an academic partner Institute who will provide necessary support to the police department/ DRSC.

Target:

- (i) The crash database should be updated latest by 31st January every year (comprising data regarding traffic crashes till December of the previous year).
- (ii) Analysis of the crash data and identification of all the critical crash locations should be done by 15th April every year.



5. Audit of identified critical locations, and recommendation & implementation of speed management measures

Description:

- (i) All the blackspots and identified critical locations based on crashes due to speeding, and crashes involving pedestrian or bicyclists should be audited (Road Development Audit) and appropriate location-specific speed management measures should be recommended to improve the safety at these locations.
- (ii) The recommended speed management measures should be implemented at those blackspots/ critical locations.

Responsibilities:

- (i) The road safety audit of all blackspots and critical locations should be carried out by the respective DRSCs with support from concerned road development department and police department.
- (ii) The recommendation and implementation of speed management measures (which are short-term in nature), should be carried out by the concerned road development department in consultation with the police department. Implementation of measures related to monitoring & enforcement should be carried out by the police department.
- (iii) Long term infrastructural interventions, if required, should be taken up further by the concerned road development department for preparation of DPR and implementation as per the current practice. In such cases, the post-implementation monitoring and enforcement should be carried out by the police department.
- (iv) If required, an external consultant/ academic institute may be appointed by the Lead Agency for carrying out the RSA at all the blackspots and critical locations and recommending appropriate improvement measures (short term and long term) in close cooperation with the respective DRSCs.

Target:

- (i) Audit of the locations should be performed by July every year and the recommended speed management measures should be implemented by November every year.
- (ii) The overall annual progress report should be submitted by the DRSC to the Lead Agency latest by 20th January every year.



Electronic Speed Monitoring and Enforcement

6. Evaluate the effectiveness of speed management interventions using the before-after studies

Description:

Before-after studies at all the locations, where speed management interventions are applied, should be carried out in order to evaluate the effectiveness of the implemented interventions in terms of change (if any) in speed profile & resulting crash frequency and fatality.

Responsibilities:

This work should be carried out by DRSC. If required, DRSC may appoint an external agency who are not involved in active enforcement.

Target:

It should be done every year during the months of August to November covering all locations where speed management interventions were done during the previous years. Every location should be evaluated for a minimum of two years. If the updated crash data shows reduction in the numbers of crashes & fatalities, then the monitoring may be discontinued at that location.

7. Development of a standard protocol for on-road vehicle fitness checks

Description:

A standard protocol should be developed for facilitating random on-road vehicle fitness checks on different categories of roads. Based on the protocol, random on-road checks should be performed regularly by each RTO to identify vehicles which are considered unfit to operate at prevailing speed limit and take suitable measures.

Responsibilities:

The standard protocol should be developed by the transport department/ RTO.

Target:

Uniform format/ procedure for on-road vehicle fitness checking across all RTOs, and to ensure that vehicles are screened at at-least 5 locations under the jurisdiction of each RTO for a minimum duration of 2 hours at each location.



8. Development of a standard protocol for on-road checks of vehicle speeds to identify violation of the posted speed limit

Description:

A standard protocol should be developed for facilitating random on-road checks of vehicles to examine the incidents of speed violations on different categories of roads (such as MDR, ODR, VR, etc. which are not covered under electronic monitoring and enforcement framework) under each police district/ commissionerate. As per the protocol, random on-road checks based on 'anytime-anywhere' approach should be conducted regularly for ensuring that the vehicles which violate the posted safe speed limit are identified and prosecuted as per the law.

Responsibilities:

The standard protocol for on-road checks of vehicle speeds should be developed by the police department. The monitoring should be done by the DRSC.

Target:

Uniform format/ procedure for on-road checks of vehicle speeds across all police districts/ commissionerates and to ensure that vehicles are screened at at-least 20 locations under the jurisdiction of each police district/ commissionerate for a minimum duration of 2 hours at each location.

9. Electronic monitoring and enforcement at pre-determined locations

Description:

Based on available crash data and speed monitoring data, sensitive places where speeding poses a significantly menacing threat (such as schools, markets, places where VRUs are exposed to high-speed traffic, etc.), should be identified for inclusion under electronic monitoring and enforcement. An implementation framework regarding adoption of electronic monitoring and enforcement should be developed, and the field-implementation should be performed with necessary notification.

Responsibilities:

The sensitive locations should be identified by DRSC. The technology-based solutions should be installed by the police department under the supervision of DRSC. However, prioritization of such sensitive locations across the state for implementing electronic monitoring and enforcement should be done by the Lead Agency.

The implementation framework for electronic enforcement (e.g., specifications for cameras, networking, calibration of the speed detectors & devices, etc.) should be developed by a technical expert committee engaged by the Lead Agency.



Target:

- (i) For the first year, 2-5 sensitive locations in each police district should be selected for inclusion under monitoring and enforcement.
- (ii) From the second year onwards, based on analysis of available crash data and speed monitoring data more sensitive locations should be included under electronic monitoring and enforcement.

10. Development of an integrated control centre under each police district/ commissionerate

Description:

Phase 1: For each police district/ commissionerate under the purview of West Bengal Traffic Police, a control centre should be developed for monitoring electronic enforcement at all locations within the district/ commissionerate. A central control centre at the state level should be developed which will eventually get the necessary feed from each of the districts/ commissionerates in the state. Initially, two control centres may be developed as a pilot project.

Phase 2: Development of more such control centres for other districts/ commissionerate as per priority and available funding. Also bring more locations, as required, within a district/ commissionerate under the purview of control centre.

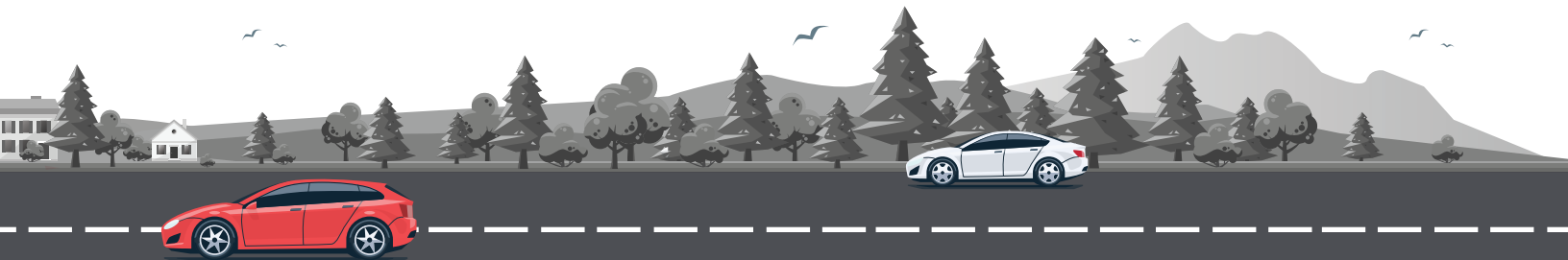
Responsibilities:

This work should be carried out by the police department under the supervision of DRSCs. However, the technical framework for the development of district/ commissionerate level and the state level control centre should be decided by a technical committee appointed by the ADG, Traffic and Road Safety. The office of the ADG, Traffic and Road Safety will update the Lead Agency about the progress of the work from time to time regarding the stages of development.

Target:

Phase 1: Two control centres should be developed as a pilot project within 1 year.

Phase 2: More districts within this task should be included and more control centres at other locations within a district should be developed every year, as per the priority and available funds.



11. Installation of Vehicle Location Tracking Device (VLTD) for all public service vehicles

Description:

Every public service vehicle should be equipped with VLTD and one or more emergency button(s) at conspicuous position(s) (commensurate with the Section 2 of the Motor Vehicles Act, 1988) with a view to achieve a more efficient enforcement of speed management over a stretch of road.

Responsibilities:

This work should be carried out by the transport department. The DRSC should monitor the progress of the work in the district.

Target:

The work is in progress and should be completed within the next 2 years.

12. Installation of speed governors in all school vehicles and public buses throughout the state

Description:

Speed governors should be installed uniformly throughout the state in all school vehicles and public buses to ensure that these vehicles do not exceed safe speeds under any circumstances.

Responsibilities:

This work should be carried out by the transport department and monitored by the DRSC.

Target:

All the school vehicles and public buses throughout the state should be covered with speed governors within the next 2 years – 50% of the vehicles in each year.

13. Development of protocol regarding usage of Intelligent Transportation Systems

Description:

A protocol for encouraging the use of Intelligent Transportation Systems, such as Vehicular Communication Systems, Advanced Driver Assistance Systems (ADAS), Traffic Sign Recognition (TSR) Systems, Intelligent Speed Adaptation (ISA) Systems, etc. should be developed with a view to enhance road safety as well as meet the demand of recent technological advancements in transportation sector.



Responsibilities:

This work should be carried out by the transport department with technical assistance (if required) from an external consultant/ academic institute/ technical committee engaged by the Lead Agency.

Target:

This protocol should be developed within the next 2 years.

14. Fulfilment of requirement of body cameras and other enforcement equipment

Description:

On-field traffic police personnel should have body cameras to avoid any ambiguity and contradictions. They should also be equipped with other enforcement equipment such as radar gun/ laser gun, safety jackets, interceptor vehicles, etc. so that they could discharge their duties safely and effectively.

Responsibilities:

The police department should submit the requirements to the Lead Agency for necessary approval. Upon fulfilment of requirement, it should be reported to the Lead Agency. The DRSC should monitor the progress of work within the district.

Target:

This requirement should be fulfilled within the next 2 years - 50% in each year.

15. Assessing the feasibility of non-monetary enforcement

Description:

Since a majority of the drivers in the state are hailing from economically weaker sections of the society, alternative equivalent methods of non-monetary enforcement should be explored keeping in mind the socio-economic perspective.

Responsibilities:

The Lead Agency may explore various possibilities by appointing a committee and/ or through awarding a suitable project to an academic institute/ consultant.

Target:

This task should be completed within 2 years.



Capacity Building

16. Capacity building of DRSC members

Description:

A 1-day capacity building programme for all DRSC members to apprise them about the need for speed management, safe speed limits, engineering measures, current best practices, existing codes, responsibilities of DRSC with respect to speed management, etc. should be carried out with a view to facilitate smoother functioning of DRSCs.

Responsibilities:

Any reputed institute/ organization having relevant expertise may be engaged by the Lead Agency for conducting the programme for all the DRSCs.

Target:

This work should be completed within June 2024

17. Capacity building of police personnel and civic volunteers

Description:

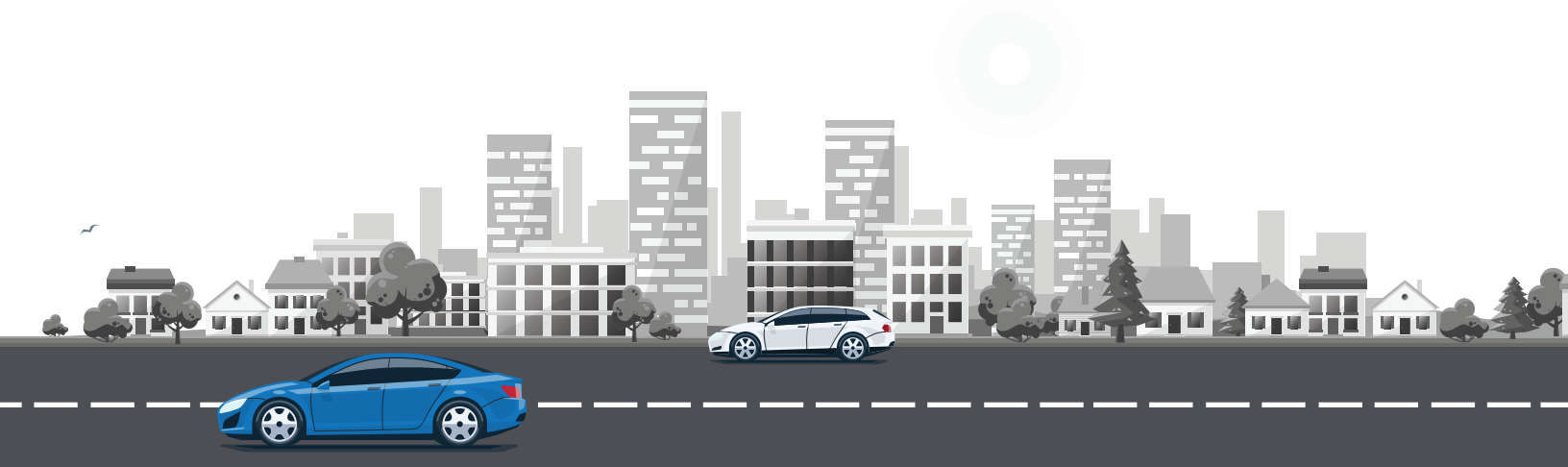
Appropriate orientation and training of police personnel and civic volunteers should be done periodically to ensure that every on-duty person involved in traffic management has relevant knowledge and background for carrying out their job effectively & efficiently.

Responsibilities:

For high-ranking police officers who are involved in decision making process, a 1-day or two half-day orientation programme(s) should be conducted by a reputed external agency having relevant expertise under supervision of the Lead Agency. For other police personnel and civic volunteers engaged in field activity, training programmes should be conducted by the already trained police officers. If required, external expert(s)/ organization may also be engaged by the Lead Agency for this purpose.

Target:

Capacity building of the high-ranking police officers should be completed within the next December 2024. Training and capacity building of other police personnel and civic volunteers should be conducted on a regular basis.



18. Capacity building of road development authority personnel

Description:

Traditionally, road development authorities such as PWDs appoint engineers having knowledge and expertise in pavement design, bridge design, and other structural aspects. However, they generally lack expertise in traffic engineering and road safety. This gap needs to be addressed through proper recruitment policy (in the long run) and capacity building programmes on a regular basis (in the short run).

Responsibilities:

The capacity building programmes should be performed by the road development department. Alternatively, if required, a reputed institute/ organization having relevant expertise may be engaged by the Lead Agency for providing support.

Target:

Training and capacity building of road development authority personnel should be conducted within December 2024.

19. Capacity building of drivers of emergency and VIP vehicles

Description:

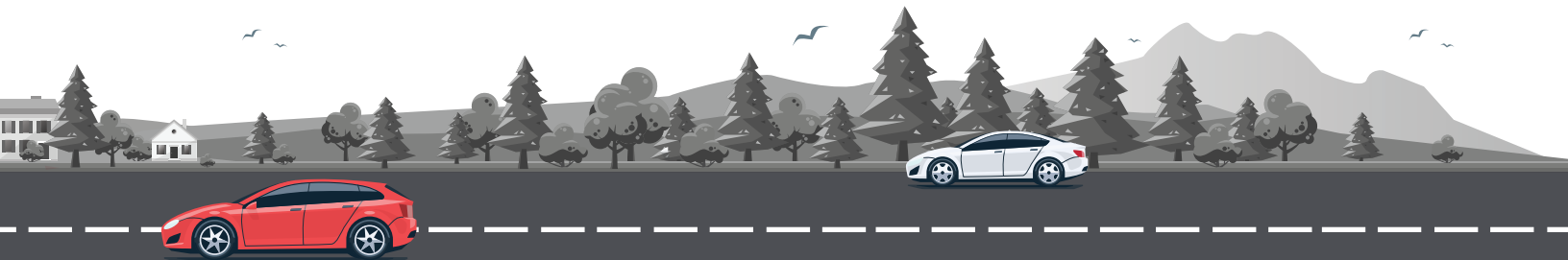
Special training programmes aiming at the drivers of emergency vehicles and VIP vehicles should be organized in order to develop knowledge on specific procedures and protocols, and improve their awareness about the dangers of high-speed driving.

Responsibilities:

These programmes should be performed by the police department/ transport department. Alternatively, if required, a reputed institute/ organization having relevant expertise may be engaged by the Lead Agency for providing support in terms of training and preparation of the course material.

Target:

This action plan should be completed within the next 2 years. The training material should also be shared with the VIPs so that they also encourage the drivers to remain careful & respectful about the speeding issues and the potential impacts on safety.



Education and Awareness

20. Awareness campaigns targeting at-risk groups, viz., drivers of trucks, two-wheelers, buses, etc.

Description:

Strategic awareness campaigns targeted to at-risk groups, viz., drivers of trucks, two-wheelers, buses, etc. should be organized at regular interval. A combination of different modes of training should be adopted to effectively impart education to the target user groups.

Responsibilities:

The work should be carried out by the police department with necessary support from the DRSC.

Target:

At least one event on quarterly basis should be organized in each DRSC jurisdiction area.

21. Awareness campaigns involving school children, parents and teachers on the effects of speeding

Description:

Road safety modules focusing on ill effects of speeding and the necessity of speed management should be incorporated into the secondary school curriculum. Regular awareness campaigns should also be organized for parents, teachers and school children in order to impart knowledge on road safety, especially speeding.

Responsibilities:

The curriculum containing road safety modules should be prepared by the education department with inputs from police and transport departments. Awareness campaigns focusing on speeding related issues should be carried out by the respective DRSCs.

Target:

The road safety modules should be designed and incorporated into the school curriculum within the next 1 year. The awareness programs should be conducted as a continuous process with a minimum of 1 such event on quarterly basis per DRSC jurisdiction area.



22. Preparation of online material for imparting road safety knowledge/ education among drivers and their evaluation

Description:

- (i) Every person who wishes to get a new driving license (DL) must acquire sufficient knowledge on safe driving before appearing for driving skill tests. For this purpose, IIT Kharagpur has been assigned to develop a training module containing 50-60 video-lectures (each about 12-15 min duration) covering various aspects of safe driving, which will be uploaded in the portal of the Transport Department, Govt. of West Bengal. A person willing to get a DL will get access to this portal to enrich himself/herself about the required rules and regulations for safe driving. Subsequently, he/she has to appear in the online test and qualify in order to become eligible to appear for the skill test to the RTO.
- (ii) The existing drivers will also be required to go through the same online module on safe driving rules and regulations and qualify in the online examination during renewal of their DL. At the same time, the DLs of the road accident offender (driver) will be kept suspended until he/she clears the online test on safe driving rules and regulations.

Responsibilities:

This work should primarily be performed by the transport department. IIT Kharagpur is responsible for preparing the training modules in three languages – Bengali, Hindi, and English.

Target:

The online material should be made available within June 2024.

23. Active involvement of print, television, and social media for enhancing road safety awareness

Description:

- (i) All the road safety awareness events should get adequate media coverage to gain more publicity of the programmes. Recommendations related to safe driving principles should be spread across the community through print media (i.e., leading newspapers) and electronic media (i.e., periodic broadcast/ live events through news media channels).
- (ii) Various online portal and social media accounts such as Facebook page, Twitter handle, YouTube channels of the stakeholders (Transport department, Police department, PWD, etc.) should be utilized for live streaming of the events, uploading/ sharing of event clippings, information regarding upcoming events, etc. periodically.

Responsibilities:

Lead Agency will have the primary responsibility in this regard.

Target:

1 media report (either in print or digital media) on speeding, its effects on road safety & fatality, interventions taken in relation to the speed management, etc. every month.

1 live event of 1hr duration (through news media channel or online event) every month.



Pilot Implementation

24. Selection of stretches across different road categories for pilot implementation of speed management

Description:

A pilot study will be undertaken where the speed management interventions will be demonstrated along a total of 8 stretches, (i) one from each – NH, SH, MDR/ODR and Village Road from rural roads, and (ii) one from each – Arterials, Sub-Arterials, Collector and Local Streets from the urban roads. These pilot corridors will be used as live examples and case studies to illustrate the entire process of speed management policy interventions with the involvement of all stakeholders.

Responsibilities:

The selection of 8 pilot stretches should be done by the Lead Agency in consultation with the respective road development departments (such as PWD, WBHDCL, P&RD, UDMA, etc.) and police department. An external organization/ education institute having relevant expertise may be engaged as a technical partner for coordinating with all the departments and carrying out the pilot study.

Target:

The selection of stretches should be completed within February, 2024.

25. Implementation of speed management on the pilot stretches

Description:

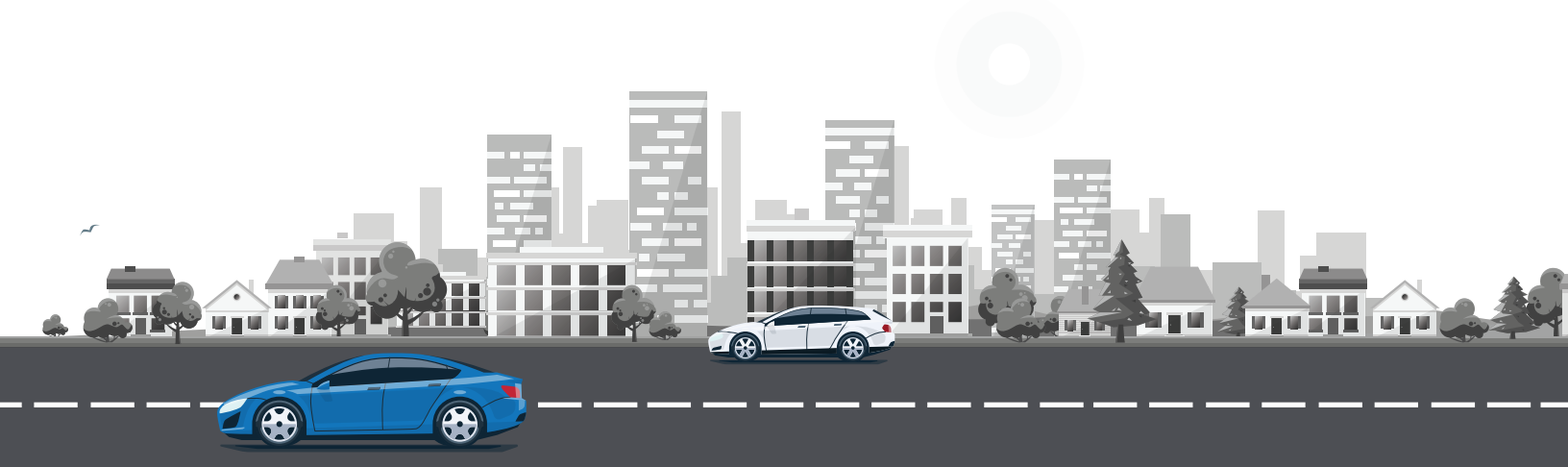
All the speed management policy intervention should be implemented on selected stretches by involving different stakeholders. The process will include all components such as Safe Speed Audit and identification of critical locations, road safety audit at all critical location, implementation of various interventions, monitoring and evaluation.

Responsibilities:

The overall responsibility for effective implementation will remain with the Lead Agency. However, the implementation of speed management interventions on pilot stretches will be carried out in close cooperation of DRSC and through involvement of all allied departments. If required, an external agency having relevant expertise may be engaged by the Lead Agency for providing necessary support.

Target:

The entire duration for completing this work is 3 years. The implementation of speed management should be completed within 1 year. The stretches will be monitored and evaluated for the next 2 years.

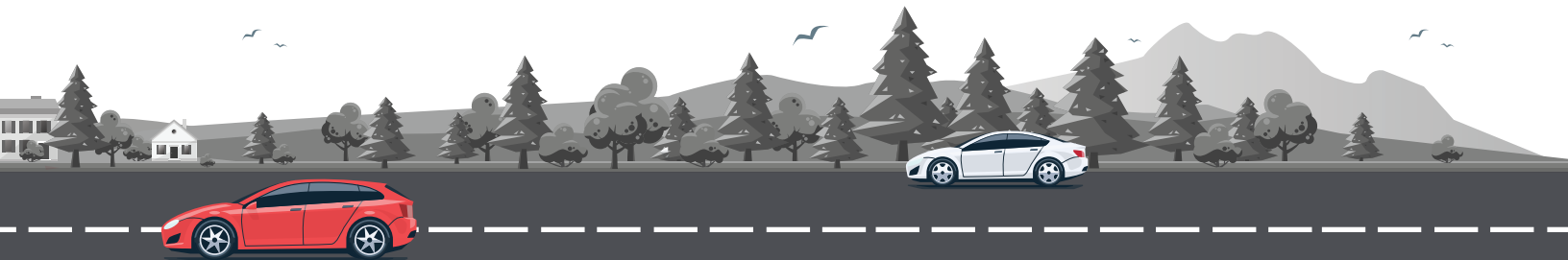


Annexure-A: Safe Speed Limits on Roads in Rural Areas

The speed limits for various scenarios of rural roads are suggested considering traffic engineering and human injury tolerance criteria. Safe speed from the road engineering point of view should be suggested by the corresponding road development authority. The minimum of the speed limits as suggested by the road development authority and as given in this Annexure-A should be adopted as the safe speed limit for a stretch of road.

If the safe speed limit suggested by the road development authority (duly considering factors such as road geometry, category of road, 85th percentile speed, etc.) is significantly higher than the speed limit suggested below which are governed by human injury tolerance criteria, then adequate engineering interventions or speed mitigation measures should be implemented to bring down the 85th percentile speed.

Scenario	Segment or Location Specific Characteristics	Maximum Speed Limit
R-I	Locations or short stretches of undivided or divided roads Frequent interactions with unprotected pedestrians and bicyclists (e.g., section of highways passing through markets, shops, schools, residential areas, hospitals, semi-urban developments, etc.)	All Vehicles: 30 kmph If crashes involving pedestrians and heavy vehicles are reported on a regular basis, then further reduce the speed limit for trucks and buses to 20 kmph
R-II	Segments of undivided or divided road - Low intensity movements of bicyclists along the side of the road in an unprotected manner, or - More than 20% share of motorcycles and slow moving motorized local traffic (both passenger and goods vehicles) such as auto/ tempo/toto/small commercial vehicles, etc. along the road without any segregation from other motorized traffic like cars, trucks, and buses, or - Contraflow of vehicles along the road (applicable only for divided carriageway), and - Not satisfying operating conditions as described in R-I	All Vehicles: 40 kmph



Scenario	Segment or Location Specific Characteristics	Maximum Speed Limit
R-III	Locations on undivided or divided road ◆ Infrequent crossing of pedestrians and bicyclists in an unprotected manner against the motorized traffic (e.g., minor junctions connecting villages, bus stop locations, etc.), or ◆ Uncontrolled intersection with occasional vehicle movements from minor roads and history of right-angle collision, or ◆ Uncontrolled intersection with narrow median width and no storage lane for right turning vehicles (applicable only for divided carriageway, or ◆ Median opening for U-turn on mid-block with narrow median width and no storage lane for turning vehicles (applicable only for divided carriageway), or ◆ More than 10% share of motorcycles and slow moving motorized local traffic (both passenger and goods vehicles) such as auto/ tempo/toto/small commercial vehicles, etc. along the road without any segregation from other motorized traffic like cars, trucks and buses; and ◆ Not satisfying operating conditions as described in R-I or R-II	All Vehicles: 50 kmph
R-IV	Segments of rural undivided road not satisfying operating conditions as described in R-I or R-II or R-III	Cars/Trucks/Buses: 60 kmph Motor Cycle and Slow-Moving Vehicles (both passenger and goods vehicles): 50 kmph
R-V	Segments of dual carriageway (or divided road) ◆ 2-lane or 3-lane on each side of the road but no clearly defined and enforced lane usage for different vehicle categories, and ◆ Less than 10% share of motorcycles and slow moving motorized local traffic (both passenger and goods vehicles) such as auto/ tempo/toto/small commercial vehicles, etc. along the road without any segregation from other motorized traffic like cars, trucks and buses; and ◆ Not satisfying operating conditions as described in R-II or R-III	Cars/Trucks/Buses: 60 to 70 kmph (depending on length of uninterrupted segments) Motorcycles and Slow-Moving Vehicles (both passenger and goods vehicles): 50 kmph Motorcycles and slow-moving vehicles should predominantly remain in left lane (and/or paved shoulder) and may use the immediate adjacent lane only for overtaking without exceeding vehicle category specific speed limit.



Scenario	Segment or Location Specific Characteristics	Maximum Speed Limit
R-VI	Segments of dual carriageway (or divided road) in rural areas ♦ High quality infrastructure with desirable minimum uninterrupted segment length of 5 km and no unprotected pedestrians/bicyclists ♦ Service road on both sides of main carriageway to allow motorcycles and slow-moving passenger/goods vehicles such as trekker/tempo/toto, etc. to operate on the physically segregated facility (i.e., service road) only. ♦ No motorcycle and slow-moving passenger/goods vehicles such as trekker/tempo/toto, etc. sharing lane(s) with trucks/buses/cars on the main carriageway. ♦ At least 3-lane on each side of road and clearly defined and enforced lane usage: ✓ Slow moving trucks, buses and cars should predominantly remain in left lane and may use middle lane for overtaking purpose or when the left lane is occupied/congested. ✓ The right most lane should be used only for overtaking. No vehicle should continue to use right most lane unless the adjacent left lane is occupied/congested and returning to the adjacent left lane is not safe. The right most lane must be free to give an opportunity for following vehicles to overtake without exceeding the permissible speed limit ♦ Desirable clear zone width of 6.5m (for max speed limit upto 90 kmph) and 9.0m (for max speed limit above 90 kmph) ♦ Not satisfying operating conditions as described in R-II or R-III or R-V	Cars/Trucks/Buses: 80 kmph or more as per road engineering criteria

Note:

- ♦ If the decrease in speed limit for adjacent segments or speed zones is more than 20 kmph, then a transition zone should be provided with an equivalent distance of travel in 25 sec (absolutely minimum)/ 60 sec (desirable).
- ♦ Safe Speed for Scenarios R-I to R-IV are governed by human injury tolerance considerations, while safe speed for Scenarios R-V to R-VIII are governed by road engineering and traffic considerations.
- ♦ All roads should preferably have a minimum clear zone width of 4.5 m. The required clear zone width increases with an increase in speed.⁴⁰

⁴⁰ American Association of State Highway and Transportation Officials. AASHTO Roadside Design Guide, 4th Edition; 2015.



Annexure-B: Safe Speed Limits on Roads in Urban Areas

The speed limits for various scenarios of urban roads are recommended based on traffic engineering and human injury tolerance criteria. If the road geometry and surface condition is not favourable then a lower speed limit should be adopted as per road engineering criteria.

Scenario	Segment or Location Specific Characteristics	Maximum Speed Limit
U-I	Segments of urban roads ♦ Passing through residential areas, market areas, school zones, etc. ♦ Frequent interactions with unprotected pedestrians and other non-motorized road users ♦ Frequent at-grade intersections (both signal controlled and uncontrolled) ♦ Roadside friction is moderate to high except for residential areas	All vehicles: 30 kmph+
U-II	Segments of urban roads which do not require a speed limit of 30 kmph (as per Scenario U-I) but also do not qualify for a speed limit of 50 kmph (as per Scenario U-III)	All vehicles: 40 kmph+
U-III	Segments of major arterials ♦ Vulnerable road users largely protected or segregated from motorized traffic ♦ Practically no interference to through traffic due to presence of uncontrolled intersections, if any ♦ Spacing of signals is high or signals are coordinated to provide a realistic opportunity for vehicles to travel at the maximum speed limit ♦ Low roadside friction with no on-street parking	All vehicles: 50 kmph+

+ If crashes involving buses are reported on a regular basis, then the speed limit for buses may be reduced by 10 km. If a separate speed limit for buses is NOT feasible based on available lanes and dedicated lane for buses is not present, then the overall speed limit for all vehicles may be reduced by 10 kmph.

Note:

- As a part of traffic management and safety, entry of trucks in large urban areas (e.g., Kolkata city) is restricted during the day time. The speed limit for trucks beyond regular working hours may be kept the same as buses.
- For long elevated corridors or at-grade segments where (i) there is no pedestrian or bicyclist, (ii) no roadside friction, (iii) movement of heavy vehicles such as buses and trucks are banned, and (iv) movement of two-wheelers is segregated, a higher speed limit may be accepted for cars and similar light vehicles as per road engineering considerations. However, the speed for two-wheelers should be restricted to 50 kmph only.



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